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THE

# EDINBURGH MEDICAL AND SURGICAL JOURNAL:

EXHIBITING

A CONCISE VIEW

OF THE

LATEST AND MOST IMPORTANT DISCOVERIES

IN

MEDICINE, SURGERY, AND PHARMACY.

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THE

# EDINBURGH MEDICAL AND SURGICAL JOURNAL.

## No. CLXIV.

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# NOTICES TO CORRESPONDENTS.

Communications have been received from the Liverpool Pathological Society by Mr Inman, from Dr John Imray, Dr M'Cormack, Dr Watson, and Mr Robertson.

The following publications have been received:—

The Anatomist's Vade Mecum: a System of Human Anatomy. By Erasmus Wilson, with 186 Illustrations by Bagg. Third Edition. London, 1845. 12mo. Pp. 648.

A Report of the Obstetric Practice of University College Hospital, London. By Edward William Murphy, A. M., M. D., Professor of Midwifery to the College, Obstetric Physician to University College Hospital, &c. &c. Dublin. 8vo. Pp. 53.

A Practical Treatise on the Special Diseases of the Skin, enriched with Cases and numerous Notes from the best authors, and the Clinique at the Hopital Saint Louis. By C. M. Gibert, Physician to the Hospital Saint Louis, &c. 2d Edit. corrected and considerably enlarged. Translated from the French by Edgar Sheppard, Member of the R. Coll. of Surgeons of England. London, 1845. 12mo. Pp. 358.

On the Diseases of the Jaws, with a brief Outline of their Surgical Anatomy, and a Description of the Operations for their Extirpation and Amputation, with Cases and Illustrations. By Richard O'Shaughnessy, Fellow of the R. C. of Surgeons of England, Bengal Medical Service, Demonstrator and Lecturer on Surgical Anatomy in the Medical College of Bengal, and Superintendent of the Gurrunhattah Dispensary. Calcutta, 1844. 8vo. Pp. 100.

A Thermometrical Table on the Scales of Fahrenheit, Centigrade, and Reaumur; comprising the most remarkable Phenomena connected with Temperature in relation to Climatology, Physical Geography, Chemistry, and Physiology. By Alfred S. Taylor, Lecturer on Chemistry, &c. in Guy's Hospital. London, 1845. 12mo. Pp. 11.

The Diagnosis, Prevention, and Treatment of Diseases of the Heart, and of Aneurism. With Observations on Rheumatism. By J. J. Furnivall, M.D., Member of the R. C. of Physicians in London; late Physician to the General Infirmary at Hertford, &c. London, 1845. 8vo. Pp. 216.

A Collection of Cases of Apoplexy; with an Explanatory Introduction. By Edward Copeman, Surgeon. London, 1845. 8vo. Pp. 205.

The Natural History of Animals, being the Substance of Three Courses of Lectures delivered before the Royal Institution of Great Britain. By Thomas Rymer Jones, F. R. S., F. Z. S., Professor of Comparative Anatomy in King's College, London, &c.; and with One Hundred and Five Illustrations. Volume One. London, 1845. Post 8vo. Pp. 362.

The Gymnastic Orthopœdical Institution in Dessau, its Management and Efficaciousness. By Dr Johann Adolph Ludwig Werner, Professor, Director of the Ducal Gymnastic Orthopœdical Institution, and of the Gymnastic Academy in Dessau, &c. Dessau, 1845. 8vo. Pp. 48.

Pulmonary Consumption successfully treated with Naphtha; with Cases from other Medical Men in support of that Treatment; and an Appendix showing the Utility of puncturing Tuberculous Cavities, as an Adjuvant in the Cure of Phthisis. 2d Ed. revised and enlarged. By John Hastings, M. D., Senior Physician to the Blenheim Street Dispensary. London, 1845. 8vo. Pp. 260.

The General Treatment and Nature of Tumours. By George Macilwain, Author of Medicine and Surgery one Inductive Science, &c., late Surgeon to the Finsbury Dispensary, &c. London, 1845. 8vo. Pp. 219.

A System of Surgery. By J. M. Chelius, Doctor in Medicine and Surgery, Public Professor of General and Ophthalmic Surgery, Director of the Surgical and Ophthalmic Clinic in the University of Heidelberg, &c. &c. Translated from the German, and accompanied with additional Notes and

Observations. By John F. South, Surgeon to St Thomas's Hospital. London, 1845. 8vo. Part II. p. 113–208. Part III. 209–304.

The London Medical Directory, 1845. Containing the Name, Address, Qualification, Official Appointments, Honorary Distinctions, and Literary Production of every Physician, Surgeon, and General Practitioner resident in London. London, 1845. 12mo. Pp. 180.

Sixth Annual Report of the Registrar-General of Deaths, Births, and Marriages in England. London, 1845. 8vo. Pp. 666.

The Structure of the Lungs Anatomically and Physiologically considered; with a view to exemplify the Wisdom, Power, and Goodness of God, as declared in Holy Writ. The Warneford Prize Essay for the year 1844. By John Moore, Student of the Queen's Coll. and Resident Med. Officer of Queen's Hospital, Birmingham. London, Birmingham, 1845. 8vo. Pp. 106.

Observations on the Growth and Irregularities of Children's Teeth; followed by Remarks and Advice on the Teeth in General. To which is added a Short Essay on Artificial Teeth. By W. H. Mortimer, late Surgeon-Dentist to the British Embassy at Paris. Second Edition revised. London, 1845. 12mo. Pp. 129.

Hints to Mothers and other Persons interested in the Management of Females at the age of Puberty. By Jonathan Toogood, Licentiate of the R. Coll. of Physicians, Fellow of the R. Coll. of Surgeons, and Senior Medical Officer of the Bridgewater Infirmary. London, 1845. 8vo. Pp. 20.

A Few Words on the Claims of the Medical Profession upon the Public. By John Robinson, M.B. 2d Edition revised. London, 1845. 8vo. Pp. 8.

Seven Lectures on Somnambulism, Translated from the German of Dr Arnold Wienholt; with a Preface, Introduction, Notes, and an Appendix. By J. C. Colquhoun, Esq. Advocate, Author of Isis Revelata, &c. Edinburgh, 1845. 12mo. Pp. 219.

Objections to Animal Magnetism or Mesmerism, with Remarks on Mr S. Hall's Lectures. By Charles Vines, Surgeon. Reading, 1845. 8vo. Pp. 23.

The Medico-Chirurgical Review and Journal of Practical Medicine. Edited by James Johnson, M.D., &c. New Series. No. 84, April 1845.

The British and Foreign Medical Review or Quarterly Journal of Practical Medicine and Surgery. Edited by John Forbes, M.D., &c. No. XXXVIII. April 1845. London.

The London Medical Gazette, Session 1844, 1845. No. 26, 22d March 1845. No. 30, 25th April 1845. New Series. No. 1, (909) May 2d. No. 914. New Series. No. 6, 6th June 1845.

The Northern Journal of Medicine, &c. Edited by William Seller, M.D., &c. No. XIII., May. No. XIV. June 1845.

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D., Surgeon to Wills Hospital, &c. No. XVIII. New Series. April 1845. Philadelphia.

The Quarterly Medical and Surgical Journal for the North-Western Provinces, (India.) Nos. I., II., III., IV., 1844. Delhi, 8vo. A new Indian Journal, edited, it is said, by Dr W. L. Macgregor.

The Medical Examiner and Record of Medical Science. Edited by Robert M. Huston, M.D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College, &c. Nos. I., II., III., IV. New Series. January, April 1845. Philadelphia. 8vo.

Weekly Tables of Mortality for the Metropolis. No. 12, Saturday, 22d March 1845, to No. 23, Saturday, 7th June.

Provincial Medical and Surgical Journal. Edited by Robert J. N. Streeten, M.D., No. 13, Wednesday, 28th March 1845, to No. 24, Wednesday, June 11th, 1845.

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1. JULY 1845.

# PART I.

## ORIGINAL COMMUNICATIONS.

### ART. I.—*Report upon the Tables of Deaths in the Census of Ireland for the year* 1841. BY WILLIAM ROBERT WYLDE, Esq. (Continued from Vol. lxiii. No. 163, p. 285.)

### DISEASES OF THE DIGESTIVE ORGANS.

No. 39. TEETHING.—The deaths attributed to this cause amount to 3,033, as 100 males to 87·67 females. The civic district offers, in comparison with its general deaths, a larger return from this cause than the rural. During the 1st year the deaths enumerated are 1,394 males and 1,195 females; up to the end of the 2d, 299 males and 289 females; in the 3d and 4th years, 60 males and 50 females have been registered. These latter, as well as 16 cases returned as deaths from teething in the A. Forms, up to the 6th year, must have arisen from some of the infantile diseases whose symptoms simulate dentition. Although death from the process of teething or cutting the milk teeth very rarely takes place, yet the term is one in very common use, as expressing, in popular phraseology, a number of infantile diseases, chiefly of the digestive organs. For this reason, deaths from teething form too prominent a feature in all modern bills of mortality. Convulsions being a frequently attending symptom of difficult dentition, complicated with disease of the gastro-enteritic mucous membrane, and also diseases of the nervous system, it is possible that many deaths from teething (popularly so called) may have been returned under that head.

The Irish term for this affection is expressive—*Cur Fiacul*,—a sowing, or planting of the teeth.

No. 40. JAUNDICE.—1,306 deaths—100 males to 68·51 females, are registered under this disease; it has prevailed most in the rural districts, and is to the total deaths from all the diseases of this class 1 in 94·81. Being so frequently a symptom of other diseases, particularly of the liver, gall-bladder, duodenum, &c., the observations already offered upon such symptomatic affections refer with equal propriety to this. Cases of jaundice were registered from 12 months to extreme old age. At the infantile period the term yellow gum, *Icterus Infantum*, is commonly applied to it; the words black and yellow jaundice are used to express its degrees of intensity. There is an affection specified in the Irish MSS. as *Buidheachair Chrochda*—the yellow spotted disease of the skin—a saffron yellow eruptive disease, different from *Galar Buidhe*—the ordinary jaundice. At the period of extreme age, deaths from gall-stones may be included in this item of the mortality. 51 patients died of jaundice in hospital. The peculiar appearance of this disease renders it improbable to have been mistaken for other affections.

No. 41. WORMS.—3,895 deaths are attributed to this cause, which is to all of the same class 1 in 31·79, the sexes being 100 males to 112·6 females. What is generally termed worm fever, and infantile remittent fever must form a large portion of these cases. From the 11th month to the end of the 10th year, 3,263 deaths from this disease have been registered, or nearly nine-tenths of the whole. The term worms is very frequently applied by the lower orders of the Irish to a variety of abdominal affections, and is, as well as marasmus, another cause of early decline. Thus, "worms picking the heart," is a common expression for cardialgia, gastrodynia, and other symptoms of dyspepsia. Ascarides, the long, the round, and tape worms, have all separate appellations in the Irish language. Only three cases occurred in hospital.

No. 42. COLIC.—1,663 cases are said to have died of this disease, as 100 males to 33·04 females;—at all ages. Abdominal pains of every kind, and proceeding from such a variety of causes, of a chronic as well as an acute or inflammatory nature, have no doubt formed the data on which a large number of these cases were returned. In infancy and early life the griping pains and tenesmus attending many diseases of the abdominal cavity, may have likewise given rise to this expression. In the northern districts in particular, the term bowel or bole-hive is in common use to denote this affection in children; and throughout the country generally, "died of a pain in the stomach—pain in the belly—an inward pain—an inward fit; or, colicky pains," are of too vague and general a nature to offer any explanation of it. A windy colic applies either to tympanites, or to some abdominal affection, with flatulence and eructation. 8 cases are returned by the hospitals; they were chiefly from the effects of lead—*Colica Pictonum*. *Treighid*, a piercing pain in the abdomen, from *Treághadh*, to pierce with the spear, is an old term for colic, used in the medical MSS., and also found in the "Annals of the Four Masters;" but

*Cuirrineacht*, literally a twisting of the intestines, attended with flatulency, is likewise expressively applied to this disease.

No. 43. Gastric Fever,—A frequent cause of death in infancy and childhood, and among young persons, and likewise known under the name of *Bilious Fever*, which, says Dr Tuomy, "is known in Dublin throughout the year, but is most frequent in autumn and winter." Cases of continued and typhus fever, and also remittents, both infantile and in adults, are no doubt included in this return, which enumerates 715 deaths, 100 males to 74·81 females, being 1 in every 173·18 of the entire class of diseases of the great chylopoietic viscera. True gastritis is fortunately rare in this country; but cases of gastro-enteritis, a disease of more frequent occurrence, may form a portion of these deaths. 108 instances have been afforded by the hospitals, and it is probable that many of these were caused by the latter affection. The *gastritis erythematica* of Dr Good may be also classed under this head.

In Ireland the term gastric fever is commonly applied to all fevers of a continued as well as remitting character attended with much irritation of the stomach or bowels, and pain over the region of the epigastrium. Deaths from gastric fever have been registered at all ages, from 1 month to 80 years; but after the first 12 months (when we may suppose in like manner with the foregoing disease (colic), that abdominal affections, attended with tenesmus, griping, diarrhœa, or vomiting, gave rise to these returns), the most fatal periods have been from birth to the end of the 5th year, when 349 deaths were recorded. The rural districts have afforded the greater number of these returns.

No. 44. Dropsy—including *Ascites* or dropsy of the peritoneal cavity of the abdomen, and *Anasarca*, or general effusion of fluid throughout the cellular substance of the body, carried off 23,332 persons, their sexes being 100 males to 87·67 females. It appears to be the second most fatal affection of this class; and the deaths are 1 in 5·3 in proportion to the total diseases of the organs of digestion, and in comparison with all causes 1 in 54·78 for Leinster, 1 in 58·32 for Munster, 1 in 43·82 for Ulster, and 1 in 45·98 for Connaught; and in the country at large during the 10 years, 1 in 50·89.

The symptoms of dropsy are too obvious to permit of its having been mistaken for other diseases; but, as has been already so frequently alluded to, it is in numerous instances but an attendant, or the sequel to other diseases, particularly of the liver, kidneys, and heart. Of these deaths 1,486 have occurred in hospitals and sanitary institutions, being to the general mortality in these establishments 1 in 27·98, and to that of the entire class of the digestive organs 1 in 1·51. It ranks third (fever and consumption being the two first), in the deaths in public institutions, and thirteenth in the order of frequency of the entire deaths from all causes now registered. Cases have been recorded at every age. Those of youth may have been the dropsy subsequent on the exanthemata. Cases of acute dropsy are not at all uncommon among children of this country. During the first 12 months 532 deaths, 239 males and 293 females, have been registered;—from 1 to 15—4,442; from 15 to 30—4,088; from 30 to 45—4,386; but in the next 15 years, (45 to 60,) the greatest number of deaths—5,970, took place; and after 60—3,366.

It appears to be most common in the counties of Fermanagh, Donegal, Galway, and the city of Kilkenny.

The Irish term *Uisge*, or water, is that employed in the MSS., and by which it is still known to the people; but *Idropus*, which appears to be a rendering of the Latin word into Irish, is assigned to this disease in the dictionaries, and is that by which it is expressed in all modern Irish works.

No. 45. DISEASES OF THE INTESTINES.—The Iliac Passion (ileus and intussusception), ulceration, stricture, cancer, or scirrhus, of any part of the alimentary canal, including the œsophagus and rectum, as well as cases of obstinate constipation, and congenital malformation, are classed under this head, the deaths of which amount to 42,—29 males and 13 females. Of these, 33 were registered from the hospital returns; 12 cases, 8 males and 4 females, were specified by the city of Dublin hospital records; as "Disease of the Rectum;"—2 males, by those of the hospitals of the county of Dublin; and 1 male, by the County Infirmary of Meath, from the same affection.

Ileus, *Sileadh an Ghair*,—spitting of the fæces, is mentioned in the MSS.

No. 46. HERNIA OR RUPTURE—proved fatal in 550 instances, 100 males to 23·04 females, its chief locality being the rural districts. Had not 114 of these deaths occurred in the public hospitals, one might be inclined to doubt the accuracy of so large a return from this disease. It is, however, an affection of a very frequent occurrence in this country; and, from the paucity and unequal distribution of medical relief, both as regards institutions and practitioners, especially in the country parts. (those from which these returns have been principally received,) death generally ensues in cases of strangulation. The want of a more general supply of trusses is also much felt in this country.—See page lxi. It is possible that the proportion of females is too small; but this may be accounted for, by the circumstance of hernia being concealed by that sex, and therefore the deaths from this cause may be attributed to, or indeed mistaken for, other diseases of the abdomen, as inflammation of the bowels or cholera morbus. It is often mentioned in the Irish MSS. as *Maidhm seicne*,—a bursting of the covering of the belly. The registries of this disease extend over all ages; during the first 5 years 72 males and 18 females have been returned, probably caused by umbilical or other congenital ruptures;—but from the 30th to the 75th year has been the age of its most frequently fatal termination. Deaths from hernia are to the general mortality 1 in 2, 158·86, and to that of their own class, 1 in 225·14.

No. 47. DISEASE OF THE LIVER—caused death in 7,038 instances, as 100 males to 65 32 females; in nearly equal proportions in the civic districts, and the open country. Compared with the diseases of the digestive organs, it is 1 in 17·59, and to the general mortality from all causes, 1 in 168·7 for the entire kingdom, which in the provinces varies, as 1 in 192·44 in Leinster; 1 in 140·83 in Munster; 1 in 164·09 in Ulster; and 1 in 210·05 in Connaught.

Diseases of the Liver, chiefly of a chronic nature (Liver Complaints), are very rife in Ireland, particularly among the lower orders; and of this the vast number of deaths from dropsy affords no bad criterion. Supposing two-thirds of the deaths from dropsy to be symptomatic of hepatic affections, without including the article jaundice, these added to the deaths returned as caused by actual disease of the liver, (even independent of many morbid states of this organ, which have been no doubt included in marasmus), then we find it is next in order of fatality, after consumption and inflammation of the lungs, of the sporadic diseases; for convulsions and marasmus are of too vague a nature, and include too many other affections, to be put in comparison with the special diseases of particular organs. The same cause (*Scrofula*) may equally contribute to the prevalence of both diseases. Acute inflammation of the liver (*Hepatitis*), as well as all the various forms of enlargement, hypertrophy atrophy, tubercular deposit, and a degeneration which is frequently and not inaptly denominated "the whisky liver"—come under this head. "Liver and Spleen," a term employed by Petty, is still retained in the country as expressive of this affection, and in the Irish language, both written and spoken, it is signified by *Duinte na n-ae*,—a closure of the liver, or a closure or obstruction of the ducts and functions of that viscus; and also *Seirglighe*, or the decaying liver. The inflammatory affections are known by the term *Laideachadh* or *Aintes na n-ae*,—an excessive heat or boiling of the liver. The A. Forms specified many deaths from disease of the liver under 1 year of age; but although there are fatal affections of that organ occurring in extreme youth, yet they do not occur in the *numbers* returned in these documents. I have added all the deaths under the 1st year to marasmus. The ages from 10 to 70 afford the great proportion of these deaths.

No. 48. Peritonitis.—Inflammation of the lining membrane of the abdominal cavity has been separated from the following disease, (inflammation of the bowels,) from 72 cases of it having been returned upon medical authority. It is not intended to represent the proportion of this disease in 1,187,374 deaths occurring in Ireland in ten years, but it is a record of the sex, age, and locality of so many deaths from this cause. The total amount of deaths from *peritonitis* is 76, the sexes being equal; it is the only disease of the entire number registered in which this remarkable circumstance occurs. Three deaths were returned from the rural and one from the civic districts, we may suppose by medical or educated persons. The lying-in hospitals have returned 10 cases; these may have been from puerperal fever. From 20 to 50 was its most fatal age.

No. 49. Inflammation of the Bowels.—The return of deaths from this disease amounts to 13,258, the sexes being 100 males to 60·64 females. That the great mass of these were abdominal inflammations can hardly be questioned; but of what particular organs or textures cannot be determined. It has been most fatal in the rural districts, as 100 to 72·71 in the civic district, and is the third most numerous return of deaths of the sporadic diseases of the digestive organs, being 1 in 9·33 of the total of that class. Compared with the general mortality, it is 1 in 75·03 in Leinster, 1 in 92·8 in Munster, 1 in 96·63 in Ulster, 1 in 103·9 in Connaught, and 1 in 89·55 for all Ireland. Only 97 cases, 60 males and 37 females, have died of this disease in hospital during the 10 years. It has spared no age, but its most fatal period has been during the 5 first years of life; and the relative proportion of the sexes holds good throughout. I know of but one Irish term that appears to apply to this disease, *Fiabhrus Feasaighe*,—fever with constipation, or the fever of constipation; but this is doubtful. It is probable that many cases returned as colic, were enteritis, or peritonitis; and for this form of disease the term *Currineacht*,—a twisting of the intestines attended with flatulency, is sometimes used.

No. 50. MARASMUS.—I have adopted this term as a generic name, under which to class all those various affections of infancy and early youth returned in the Census papers, as consumption (infantile), wasting, decay, decline, emaciation, general debility, and loss of strength, &c., and not intended to apply to *tabes mesenterica*, or any other state of atrophy *in particular*. This arrangement became necessary from the multitude of deaths returned as consumption and decline, under 1 year of age and from 1 to 10. This accounts for the sudden break in the table of *diseases and ages* from this cause at the 10th year, and the sudden increase of consumption (understood to be *phthisis pulmonalis*) after that age.

There can be little doubt that the great majority of cases of infantile deaths returned under the above popular headings were caused by scrofulous tubercular diseases, chiefly of the abdominal cavity, many of *tabes mesenterica*, and many of chronic peritonitis, a disease of frequent and fatal occurrence in young children in this country. Tumidity of the abdomen and general emaciation form, no doubt, the prominent symptoms of the maladies here specified, though there may have been many cases of disease of the lungs included in them, as well as all general tubercular diseases of early life. The total deaths registered under *marasmus* number 68,650, the sexes being 100 males to 105·81 females. It is next to convulsions the most fatal affection of early life; the deaths from this cause (or rather these causes) being however 25,445 less than convulsions during the 1st year; but it is remarkable that it differs from that disease in the female exceeding the male deaths at all ages after the first year. During the first 5 years, it is 1 to 0.86, compared with small pox; 1 to 0·43 with measles; 1 to 0·09 scarlatina; 1 to 0·59 hooping cough; 1 to 0·7 croup; 1 to 0·02 thrush; 1 to 0·3 pemphigus; and 1 to 3·45 of the total class of epidemic affections; 1 to 1·15 convulsions; 1 in 1·25 of the total class of diseases of the digestive organs; and of the general mortality from all causes up to the same period 1 in 7·67.

*Cnai* or *Cnaoidh*, a wasting or decay, with or without disease of the chest, is applied to this in Irish; and when the affection presents itself in the form of *tabes mesenterica*, or general atrophy, many superstitious notions are entertained by the peasantry respecting its probable cause, such as the child (generally an infant) being under the influence of spirits or fairies, the "gentry" or the "good people;" and hence the term in such common use, "back gone," or "fairy stricken;" more than one of the A. Forms gave these returns, and one "The fairies tuck him away."

The mortality from this disease has been as 100 in the civic to 226·6 in the rural districts, compared with the total deaths in these localities. In proportion to the deaths from all causes, it appears to be 1 in 13·9 in Leinster; 1 in 18·21 in Munster; 1 in 17·14 in Ulster; 1 in 25·01 in Connaught; and in the kingdom at large 1 in 17·29.

Two deaths from marasmus have been registered, on medical authority, at a later period than the 10th year; they have been received from the hospital records.

The total deaths from the diseases of the digestive organs, amounting to 123,828, as 100 males to 90·98 females, are, in comparison with all other affections, 1 in 8·73 in Leinster; 1 in 10·01 in Munster; 1 in 8·99 in Ulster: 1 in 11·59 in Connaught; and 1 in 9·58 in the entire country for the 10 years.

No. 51. Stone.—Calculous affections, particularly of the kidneys and bladder, are, it is a fact of universal acknowledgment, rarer in Ireland than in any other part of the British Isles. 58 deaths are attributed to this cause in ten years, 49 males and 9 females; but as 45 of these cases were returned in the A. Forms of the rural district, I am inclined to think (from the little knowledge possessed by the people on this subject) that this may be an exaggeration, and that cases of other urinary diseases were returned under this head. 5 deaths occurred in the civic districts, and 8 in hospital, 7 males and 1 female. Deaths from this affection are recorded at all ages, and 11 under 1 year; some of these in particular may have been other forms of disease of the urinary or genital organs; 10 from 1 year to 15; from 15 to 30 we find but 4; from 30 to 60 as many as 18; and after 60 years of age 13. The majority of cases of *Stone* being generally received into hospital, it may not be too much to say, that about 5 per annum is a near approach to the deaths from Stone in the Bladder in Ireland.

It is mentioned in the MSS. as *Cloch fuail*,—the urine stone, or *Cloch an leis*,—stone in the bladder, in contradistinction to *Cloch na n-araun*,—the renal calculus. At the later ages it is possible that *enlarged prostate*, a much more frequent disease, may have been the cause of many of these deaths.

No 52. Stricture.—The records of the public hospitals (the best criteria on the subject) show that stricture has decreased in the metropolis of late years. 28 fatal cases have been afforded by the Census inquiry, 25 of which having died in hospital, this return may be relied upon.

Many of the Irish names for urinary diseases are very apposite

In the present instance *Fostadh fuail,—a detention of urine already formed*, by mechanical means, is accurately distinguished from the disease of the kidney, *Cosg fuail*, a non secretion or malsecretion of urine. So expressive is the Irish language, and so full, accurate, and defined are the terms used in this tongue for the different forms of disease, that the word retention would be here inapplicable, as implying a voluntary power over the urinary organs, while *Fostadh fuail*, or *de*tention, arises solely from disease, and is involuntary.

No. 53. EXTRAVASATION OF URINE.—The result of injury, operation, or the giving way of some portion of the urinary apparatus, is of such a nature as could only be expected to be afforded upon medical authority, or as the result of a *post mortem* examination. 21 deaths, 20 males and 1 female, have been registered from the hospital forms, 14 at from 20 to 60 years of age; but in 7 instances these records do not afford information as to the age at which patients died from this affection. Had the original disease or accident which led to the extravasation been afforded, it would have added to the interest of this item in our list of deaths.

No. 54. URINARY DISEASE.—Up to a very recent date diseases of the urinary organs were but little known even to medical men, and still much remains to be done in elucidating this part of medical and surgical science.

Such being the state of *medical* knowledge, but little accurate information could have been expected upon this subject from the great mass of the community. The term *Gravel* is a popular expression for most of the diseases of the urinary organs attended with strangury, or retention or suppression of water, and no doubt includes a vast variety of the diseases of the secreting and excreting organs, kidneys, bladder, urethra, and prostate gland. Congenital malformation of these organs may have caused death at many of the early ages—stricture and diseases of the kidneys, at the middle ages, particularly Bright's disease (granular kidney); but when dropsy followed as a symptom of such affections, no doubt the cases were recorded under that head; and at the advanced ages, in all probability, disease of the prostate gland was the most frequent cause of death.

The total number of deaths from urinary diseases amounts to 2,849, as 100 males to 13·46 females. 83 cases, 76 males and 7 females, were afforded by the hospital returns. Of the remainder the great majority were furnished by the A. Forms of the rural districts. (For Hospital Returns, see Tables, pages 194 to 204.)

No. 55. DIABETES,—is said to have proved fatal in 118 instances, 92 males and 26 females. Of these cases 24 occurred in hospitals, 20 males and 4 females. Increased discharge of urine containing saccharine matter, attended by a morbidly increased thirst and appetite—the prominent symptoms which characterize this disease—are, with the exception of the saccharine deposit lately discovered, frequently alluded to in the Irish MSS. separately and conjointly; and of the latter, in particular, there are many legends in existence, such as that of St Mainear, the founder of Kilmainham, in the 7th century, an account of which will be found in *Leabhar Breac*, or Specked Book of Ballymoate, in the library of the Royal Irish Academy.

Whether the cases of immoderate appetite mentioned in Irish history were really the consequence of, or connected with, *diabetes mellitus*, or diseases of the digestive functions alone, the context affords no means of ascertaining. The derivation, however, of the third Irish term which I have adopted in the Nosology is interesting, as explanatory of an ancient pathological tradition in this country;—*Airc Luachra*, the lizard of the rushes, (*Lacerta Agilis*,) is believed by the country people to enter the throats of persons who may happen to fall asleep in the open air, and taking up its abode in the stomach, it there generates, by its inordinate craving for food, the disease called *Lonnchraos*, or ravenous appetite, literally "a stowing of food in the throat," an ancient classic term found in the tracts of the 7th and 8th centuries; or *Airc*, the lizard; and hence perhaps the English popular term of *Wolf*, or "wolf in the stomach." Sir H. Marsh attributes the frequency of diabetes in these countries to "atmospheric vicissitudes."

Nos. 56 & 57. DISEASES OF THE BLADDER AND KIDNEYS,—including all those specified in the Nosological Table, page viii., are of such a nature as could, with few exceptions, have been alone returned upon proper medical authority, and are therefore found only among the deaths of the hospitals and sanitary institutions. 56 cases of disease of the bladder, 48 males, and 8 females, and 7 of disease of the kidney, 4 males, and 3 females, proved fatal during the 10 years. (For the ages of the three last diseases, see General Summary of Hospitals by Ages, page 204.)

The total deaths from diseases of the urinary organs are 3,137, their sexes being 100 males to 14.07 females. In proportion to all the diseases and casualties this class of affections has proved fatal to 1 in 342·17 in Leinster; 1 in 548·05 in Munster; 1 in 317·74 in Ulster; 1 in 342·03 in Connaught; and 1 in 378·5 in the entire kingdom.

No. 58. CHILDBED—or its immediate consequences, puerperal fever, floodings, and inflammations, proved fatal to 13,903,—383 cases of which occurred in the hospitals and sanitary institutions, 1,562 in the civic districts, or 1 in 149·91 of the entire deaths of the towns of or above 2,000 inhabitants, and 11,958 in the rural district, or 1 in 76·23 of all the deaths of the minor towns and the open country. The provincial comparisons of this with all the causes of death appear to be 1 in 96·97 in Leinster; 1 in 79·61 in Munster; 1 in 100·63 in Ulster; 1 in 66·91 in Connaught; and 1 in 85·41 in the entire kingdom.

Nine deaths occurred at, or under 15 years of age; from 15 to 20 inclusive, 563; from 20 to 30, (the most fatal age,) 6,603; from 30 to 40, we find 5,567 deaths recorded; from 40 to 50 the number visibly decreases, being but 1,084; from 50 to 55,—42; and from 55 to 60, 10 deaths in childbed have been registered—1 death at 66 occurring in the townland of Ballypatrick, parish of Temple-etny, in the county Tipperary, in the year 1832, has been returned and registered. In this case the age of the husband is reputed to have been 72 at the time of the wife's death, and the date assigned to the marriage is 1780. Similar cases being on record, it has been registered accordingly. For the immediate cause of death in 383 cases occurring in hospitals, see Tables of Lying-in Hospitals, and page lxv. of this Report.

No. 59. Prolapsus Uteri—proved fatal in 4 cases; but this, in all probability, is but a portion of the deaths from this cause for the period specified. Any of the diseases of the female genital organs, or the anus, is thus popularly termed, " a disease between me and the ground." In Irish the uterus is termed " The place of the son," and hence the expression, *Tuitim an Mhaclaigh*,—a falling of the womb, or a falling of the place of the son.

No. 60. Ovarian Dropsy.—The hospitals afford 6 deaths from this cause, 2 aged 20 to 25, and 3 at from 45 to 50. The remaining deaths from ovarian dropsy, which it may be fairly conjectured amounted to three times this number at least, have, if registered at all, been returned under the general head of dropsy.

No. 61. Cancer Uteri.—The deaths from this cause amount to 49,—30 of which occurred in hospitals. The ages at which this disease proved most fatal were 35 to 40, and 45 to 50. 1 death has been registered from 20 to 25, perhaps from polypus, or some other malignant disease of the womb. The hospital registries afford a return of 3 deaths, each aged from 25 to 30.

A few male deaths from disease of the generative organs, as *cancer scroti*, &c, have been registered under the general head of cancer. The total deaths from the diseases of the generative organs amount to 13,962, being in proportion to the deaths of females from all causes, 1 in 40·57; and to the total deaths of males and females, 1 in 85·04. No cases of chlorosis or mismenstruation were recorded in the class paramenia.

No. 62. Rheumatism.—Acute and chronic arthritis, (many of which were probably cases of venereal), and inflammations of the joints and periosteum; what is generally termed rheumatic fever, and all fatal diseases attended with rheumatic pains of every description, have been in all probability the grounds on which those deaths were recorded, amounting to 3,511, in the proportion of 100 males to 80·97 females.

It appears to be an affection of greater prevalence and fatality in the rural than the civic district. 162 cases were registered from the hospital forms. The disease is well known to the country people under the English name of " the rheumatics," and is forcibly expressed in the native tongue by the term *Scoilteach*, or splitting of the bones. The MSS. employ the expression *Siubhal an Reama*, a moving of the humours, as indicating flying or rheumatic gout. Cases of gout, pericarditis, and also sciatica and lumbago, if such have proved fatal, may have been returned under this head. Sweating houses, a rude species of Russian bath, are still in vogue for the cure of rheumatic affections, particularly in the western parts of Ireland.

The very early age at which a few cases have been recorded, lead us to suppose that they were instances of diseased bones or joints, perhaps rickets.

The great majority of the deaths from this disease were stated in the returns to have taken place at from 45 to 80.

No. 63. DISEASES OF THE BONES AND JOINTS.—A vast number of affections, chiefly of a scrofulous character, are included within this extensive definition, which in our present state of knowledge it was not possible to subdivide. Indeed this and the two following affections, diseases of the spine, and of the hip, might have been all classed together. The disease, however, marked No. 63 in the Nosology, and which takes in necrosis, caries, ulceration of the cartilages, white swellings, and rickets, and possibly some of the affections of the joints attendant on advanced life, affords a return of 1,903 deaths, as 100 males to 63·48 females. It has, in comparison with the population and general mortality, been most destructive in the rural district. 146 cases, 91 males and 55 females, occurred, in the hospitals, of which but 1 male and 1 female were specified as having died of " white swelling." 1 female was also recorded in the A. Forms of the civic district of the county of Dublin.

Rickets was either more frequent, or attracted more attention in former times in Ireland than at present. Thus, Boate devotes a section of his chapter on " The Diseases reigning in Ireland" to this subject, and says,—" Among the reigning diseases of Ireland, the rickets also may, with good reason, be reckoned a disease peculiar to young children, and so well known to every body in England, as it is needless to give any description of it; and yet to this day never any physician, either English or of any other nation, made any the least mention of it—no not in those works which are expressly written of all manner of diseases and accidents of little children. In Ireland this disease is wonderful rife now, but it hath nothing near been so long known there as in England, either through the unskilfulness or neglect of the physicians, (the most part whereof in both kingdoms to this day are ignorant not only of the manner how to cure it, but even of the nature and property thereof,) or that really it is new there, and never before having been in Ireland, hath got footing in it only within these few years, through some strange revolution or constellation, or God's immediate sending; which kind of changes several times have befallen in divers countries, and in Ireland itself we have already shown some such matter in another sickness, namely, the tertian ague." And again he adds,—" The rickets are of late very rife in Ireland, where few years ago unknown." This may account for our not having found it mentioned in the MSS.

In olden time, rickets was probably applied to many other affections of the bones not then properly described or classified; Petty classes together " rickets and liver grown." Deaths from diseases of the bones and joints have been recorded at every age.

No. 64. HIP DISEASE.—Under this head, in both the infantile form and that of *morbus coxæ senilis*, or the disease of the head of the femur and the acetabulum, at present well known in this country, and formerly designated chronic rheumatism, 89 deaths, 61 males and 28 females, are recorded, 54 of which occurred in hospitals. The A. Forms seem to have been defective in this disease, the deaths have been probably returned under the head of evil, scrofula, ulceration, or decay. From the 5th to the 60th year the great majority of these deaths took place, but the most fatal period was from 10 to 25.

No. 65. SPINE DISEASE—carried off 325 persons, the relation of the sexes being as 100 males to 46·39 females. 69 died in hospital, 48 males and 21 females. Both it and the foregoing disease have been more fatal in the civic than the rural districts. Deaths have been returned at all ages; but from 5 to 30 was its most fatal period. The Irish terms for both the diseases of the Spine and Hip are but literal translations of the English words.

The medical periodicals of this country, and the many splendid pathological collections afford many instances of Caries, Exostosis, &c. &c. Such, however, were not specified in the hospital returns upon the present occasion.

The total deaths caused by diseases of the locomotive organs are 5,828—the sexes as 100 males to 72·06 females, and the proportion to the deaths from all causes, 1 in 203·73.

Provincial comparisons cannot be of much value or importance in this or the following class.

No. 66. ULCERATION.—This is one of the terms which I have adopted as a generic word, under which to register the return of deaths from "Scurvy (so called), ulcers, scorbutic, lupus," and such other diseases of the tegumentary system, afforded by the A. Forms, as were characterized by, or attended with ulceration. True scurvy, though a disease scarcely known here, is applied to all indolent and many scrofulous sores, lupus, and other diseases of the skin, as well as ulcers of different kinds. There are, however, extensive ulcers almost peculiar to this country, and some places in particular (as for instance, Wicklow) appearing for the most part on the nates and thighs, of a phagedenic and reputedly scrofulous character, and said to resemble sibbens. Cases of rupia and other syphilitic ulcerations have, no doubt, been included under this head. The total deaths registered from ulceration are 3,399—the sexes as 100 males to 58·09 females. It forms the chief scurce of the mortality of this class. 257 cases occurred in hospitals; but the great mortality took place in the rural district. Sloughing and phagedena, from various causes, have produced death in several of the cases in hospitals, and perhaps in those returned by the A. Forms also. Button scurvy (*Morula*) is a disease frequently met with in Ireland. The hospitals of Dublin are seldom without a case of it.

Affections of the skin appear to have been well known to the ancient Irish writers, and denominated *Bruith in Chroicin*, a heat or boiling of the skin—scaly eruptions, *Ruainnea*, hair, probably a form of tenia,—itch, *Tochus*,—herpetic eruptions, *Salchar Croicinn*, literally filth of the skin;—and scald head, *Carradh*, a rock from its rugged appearance. One case of Phthiriasis, *Grain Mhiolach*, the lousy evil, or *Morbus Pedicularis*, was returned in a female aged 75. Under the general head of ulceration may be included all those diseases of the tegumentary system not specified in the four following diseases.

No. 67. PURPURA.—Two descriptions of this disease are known in this country, an acute and a chronic, with and without hæmorrhage, with and without febrile symptoms. The latter affection, in particular, was well known to the Irish from a very early period, under the name of *Galar Breac*, or the speckled disease, and in English "the purples" and "blue spots." Properly speaking, the *purpura hæmorrhagica*, attended with spongy and livid and sometimes bleeding gums, would be more appositely placed under the head of scurvy, to which it appears to approach nearer than any other disease of this country. Hence some Irish writers have designated it "purpura, (scorbutic rash or land scurvy)."—Wallace. The deaths from purpura are 39, *i. e.*, 21 males and 18 females; of these 31 cases died in hospital, 18 males and 13 females. 30 of these deaths whose ages have been recorded are very equally distributed over that period from the 12th month to the 60th year. It has not been found in the MSS., unless in the allusion made to it in the book of O'Sheil.—(See page 10.)

No. 68. FISTULA.—64 deaths, 54 males and 10 females, have been returned from this disease; but whether cases of *fistula in ano*, or *fistula in perineo*, or fistulous openings of other parts, it is not possible to say. The hospital records afford 24 cases, 21 males and 3 females. This disease is one of very frequent mention in the Irish MSS., and divided into several varieties; thus, there is wet fistula, *Feadan*,—a small tube or running stream, and dry fistula, *Linighan*, —a stagnant pool.

No. 69. ANTHRAX—The return of 26 deaths, 19 males and 7 females, from this affection were received only from the hospitals and sanitary institutions. Of the cases whose ages have been specified, it has proved most fatal from 35 to 70. The Irish term *Meall*, a lump containing matter, though usually applied by the people and in the MSS. to carbuncle, is equally applicable to any description of abscess, tumor, or swelling.

No. 70. LEPRA.—Whether the true *Lepriasis* or *Lepra Græcorum* was ever endemic to Ireland, no records of sufficient authenticity remain to inform us. That a cutaneous disease of an infectious nature, and of such characters as to require the interference of the State and the Local Government once existed in this country, the number of *leper houses* and *leper hospitals* that were formerly supported here, plainly attest. Some of these (the leper house at Waterford, for instance,) still retain the appellation derived from their original uses. Boate, when speaking of the increase of rickets in Ireland, says,—"So on the contrary it hath been almost quite freed from another disease, one of the very worst and miserablest in the world, namely; the leprosy, which in former times used to be very common there, especially in the province of Munster; the which, therefore, was filled with hospitals, expressly built for to receive and keep the leprous persons. But many years since Ireland hath been almost quite free from this horrible and loathsome disease, and as few leprous persons are now found there as in any other country in the world;

so that the hospitals erected for their use, having stood empty a long time, at length are quite decayed and come to nothing." This author states, that the reason assigned for the great prevalence of leprosy at that time was the eating of "boiled salmons, hot out of the kettle, in great quantity." This was, however, I am inclined to think, but an ingenious device of the period, to assist in preserving the fish when out of season, on the introduction of the game and fishery laws; for he himself adds,—"The English having once gotten the command of the whole country into their hands, made many severe laws against the taking of salmons in that unwholesome season, and saw them carefully preserved."

The peculiar spent, and scaly, or leprous condition of the salmon after the spawning season may have lent some degree of credence to this report. Psoriasis, scaly eruptions, ichthyosis, elephantiasis, and other tubercular diseases of the skin are by no means uncommon in Ireland at present. Rupia, and other venereal affections of the tegumentary system, may have been likewise included under the head of lepra, a term frequently found in the Irish medical MSS. This disease is also mentioned in the early historic remains of this country, particularly in the lives of the saints, several of whom had been affected with it.

The total deaths registered under this head amount to 17, *i. e.*, 13 males and 4 females, and 13 of these occurred in hospitals. *Bruisingnidhi*, a peculiar disease of the nails, is mentioned in the Irish MS., No. 6–4, in the library of the Academy, and said to have arisen from excessive grief. It does not appear to have been onychia.

The total deaths caused by the diseases of the tegumentary system amount to 3,545, as 100 males to 57·06 females, being in proportion to the deaths from all diseases and casualties 1 in 334·94. It must, however, be borne in mind that persons affected with any very obvious or remarkable disease of the skin, and dying from any other cause not known, would, it is very likely, be returned by their friends as having died of the external disease with which they happened to be affected at the time. This class of affections has proved most fatal in the rural districts. Its provincial comparisons with the general mortality are, 1 in 386·73 in Leinster; 1 in 259 in Munster; 1 in 538·48 in Ulster; and 1 in 271·45 in Connaught.

No. 71. INFLAMMATION.—No term is in more general use, and none more vague and indefinite, in a statistical point of view, than this, which, from its being either the proximate or remote cause of death—the original or subsequent affection—in so many of the ills to which man is subject from the cradle to the grave, and also the process by which healing or repair takes place in living bodies, might be applied to at least one-half of the diseases specified in the Nosology. This definition must, therefore, in our present state of knowledge, (and it is the case with nearly all other tables of deaths yet recorded), stand as a general term, in like manner with marasmus, or infantile convulsions; for all those deaths in which inflammation, either of external parts or of some of the internal organs or viscera, not specified under separate heads (as pneumonia or peritonitis,) took place, but different from marasmus or convulsions, it was in all probability the *cause* of death, they being only the symptoms of disease.

From this cause, 15,263 deaths have been registered, the sexes being as 100 males to 69.9 females. The districts afford nearly equal numbers, but the females are more numerous in the rural. The hospitals specify 88 deaths, 76 males and 12 females, from Inflammation; but where situated, of what character, or by what caused, has not been stated. Every age has been assigned to this disease, from extreme infancy to old age. During the first 5 years, 7,079 deaths, 3,979 males and 3,100 females, have been registered, so that many of the diseases of childhood must have been included under it.

No. 72. PHLEBITIS.—The characters of inflammation of the veins are so little known to the general (non-medical) portion of the community, that any record of this formidable affection could only be afforded by the sanitary institutions, or upon medical authority. 9 deaths, 3 males and 6 females, have been registered from this disease, of which 3 females were cases of *phlegmasia dolens*, which have been placed under this head as the most unobjectionable, the data being too slender, and the number of cases of this latter affection too small, to form a separate species in any of the classes; either in this or in diseases of the generative organs. (See Report on Lying-in Hospitals, page lxv.)

No. 73. MORTIFICATION.—Without the particular seat of the affection being specified, this is likewise a term vague and indefinite in all bills of mortality; for although deaths by gangrene occur more frequently, from its attacking external parts rather than any of the internal organs, yet it has certainly been in these and in many similar returns of deaths, applied to affections of the cavities and internal parts. Thus, "inflammation of the bowels" was, even in medical language, up to a very recent period, said to prove fatal when "mortification set in," and yet modern pathologists find that, in the great majority of such cases, no gangrene had occurred, but effusion of either lymph or serous fluid was the only morbid appearance discoverable upon dissection. Mortification is also erroneously applied by the country people to very many of the fatal terminations of infantile diseases. These are errors that must, however, exist until some proper registration of the deaths of this country is established, and even for some time after. The total deaths returned as having been caused by mortification are 5·810, as 100 males to 72·5 females;—but for the reasons already stated, this item in our deaths must be received with caution, especially at the early ages. The rural district has furnished the great proportion of these deaths; 189 occurred in the public hospitals, and may therefore be safely relied upon; they were 114 males and 75 females. In all future inquiries of this nature, the medical records of such institutions should furnish an account of the cause of gangrene, whether the result of accidents or operations, traumatic or idiopathic, the effects of cold or exposure, or from disease of the arteries, and also state the part affected, and if from hospital gangrene;—all circumstances that would have greatly increased the value of the 189 deaths thus statistically arranged. Of this number 2 males and 5 female deaths have, however, been recorded as having been caused by Gangrena Senilis, *Pott's* or *dry gangrene* —sometimes called in Ireland " the dry rot,"—by the hospitals of Dublin city, and one male, by the A. Forms of the same locality. Some years ago mortification was much more frequent in Ireland than at present, as gangrene of the feet was a common occurrence in the country parts, from the effects of wet, poverty, and exposure, during the fevers to which the working classes have been so subject, and also from the wet, cold, and hardships attendant upon exposure on the decks of sailing packets;—the annual emigrants suffered extremely from this cause.

Of the Irish definitions for mortification, *Morgadha* is an old expression, and *Aingceas*, that now in general use, is well suited to the purpose, being " an excess of inflammation." Cases of *cancrum oris* and phagedena were probably included under this head.

No. 74. WOUNDS—amount to 195; that is, 159 males and 36 females. They have been either accidental or designed, and include wounds of every description, except those fatal injuries of the head already specified under that affection. With two exceptions, all those deaths occurred in hospitals.

No. 75. HÆMORRHAGE.—All internal and external hæmorrhages, from disease or accident—epistaxis, varicose veins, and such cases as were designated " bursting of a blood-vessel," which have not already been included in hæmoptysis, hæmatemesis, aneurism, and child-bed, are specified in the returns of this disease, which amount to 2,049, as 100 males to 44·19 females. Cases have been registered at every age, but the great majority occurred between 15 and 60.

No. 76. MALIGNANT FUNGUS.—Independent of the cases of *fungus hæmatodes*, *osteo-sarcoma* and other fungoid diseases returned by the hospital forms, the great number of deaths at the very early periods of life enumerated in the A. Forms as cases of cancer, rendered it necessary to adopt some term under which to class those *reputed* deaths from cancer which took place at such ages as are known to be exempt from that disease. Virulent and unhealthy ulcers, as well as diseases of a truly malignant nature, are commonly termed Cancer by the lower orders. Except where the returns could have been depended on, as in cases of hospitals, the infantile deaths (that is, under the first 12 months,) returned as from cancer were registered under ulceration, and after that age placed to malignant fungus. The total deaths registered from these causes are 200, or 109 males and 91 females; but with the exception of 34 deaths in the hospitals, 21 males and 13 females, little reliance can be placed upon this return; for until very lately fungoid diseases and *fungus hæmatodes* in particular, were not clearly understood even by pathologists.

The deaths in hospital from this cause have taken place from the 2d to the 70th year.

No. 77. SCROFULA.—Were the history and symptoms of at least one-half of the deaths from the sporadic diseases enumerated in the 671,960 deaths from these causes accurately known, it would perhaps fall short of the number of deaths that might be traced directly or indirectly to this taint; for tubercle in one form or other is one of the most frequent causes of death, (not produced by infection or contagion,) in this country. The deaths specified in the Census returns "scrofula" "the evil," or "the king's" or "running evil," amount to 3,149, as 100 males to 64·01 females; of these 2,759 were afforded by the A Forms of the rural, 256 by those of the civic district, and 134 by the returns of the hospitals and sanitary institutions; but even in those latter the symptoms of, or the parts affected with, this disease were not always specified. Scrofulous ulceration, necrosis, and diseases of the joints were, it is more than probable, the principal cases upon which these returns were founded. Deaths from scrofulous affections have been returned at all ages.

The Irish MSS. make frequent mention of this disease, and the Irish language has many terms and expressions for its different varieties. *Easbadh*—a want or deficiency, is a general term for all strumous affections, analogous to the English expression "poverty of blood;"—as the disease or its effects appear most obviously in the neck, *Easbaibh Braghad*—a deficiency in the neck; and in cases of scrofulous ulceration, *Cneadh Cnaitheach*, the wasting ulcer, is applied. *Fiolun*, popularly pronounced *Filloon*, probably from *Feall*, treachery—the treacherous disease—is especially indicative of the disease attacking the joints or their immediate neighbourhood, as in scrofulous ulceration, of the ends of the bones or the cartilages; also necrosis and caries; and it is sometimes applied to fistulous openings in other parts as well as the articulations, and even to extensive inflammations, particularly of a phlegmonoid erysipelatous character. The term *Easbaibh Braghad*, is that employed in the MSS., and is, I am inclined to think, the most correct and general definition of scrofula and the frequency of glandular enlargement of the neck, followed by unhealthy or eating ulceration *Cneadh Chnaitheach*, and leaving a deeply depressed and contracted cicatrix, in this country lends support to that opinion. In some of the country parts, the south generally, and the country of Clare in particular, *Cuit Braghad*, literally eats in the neck, is also applied to scrofulous affections of that part.

No. 78. GOUT.—360 deaths, 318 males and 42 females, have been registered from this disease, of which number 42 males died in hospital. 2 deaths under 20 years of age have been returned under this head; the true cause of death was probably arthritis. From 45 to 80 has been the fatal period of this affection, both in the hospital returns and the general summaries. Gout has proved more fatal in the rural than the civic district. The Irish word *Guta* appears to be a mere Hibernicism; but *Galar na na-alt*, or the disease of the ankle-joints, is likewise employed to denote this malady. The former is used in the MSS., the latter still exists in the mouths of the people.

No. 79. CANCER.—The acknowledged fatality, and the well-known prevalence of cancerous affections in Ireland, may warrant a return of 3,890 deaths from this cause during ten years, or 1 in 305·23 of the deaths from all causes; the proportion of the sexes being nearly equal, or as 100 males to 97·36 females. It seems to have prevailed most in the rural district, as 100 to 58 in the civic. 204 deaths (the sexes being equal) occurred in hospital; but as incurable and chronic diseases of this nature do not generally receive admittance into hospitals, or are generally dismissed, and the subjects of them return to their friends, before death takes place, this number affords no criterion whereby to judge of the mortality from this cause. When the workhouses are fully in operation, and that these persons are afforded an asylum within their walls, the return of deaths from cancer, during the same space of time, will in all probability be increased threefold.

Cases returned—*Cancer*, in the A. Forms at extreme youth were registered *scrofula*, which, especially when it appears in the tegumentary system, or in the ulcerative form, is frequently confounded with cancer; and cases under 20 were registered malignant fungus, which includes all malignant diseases as well as *fungus hæmatodes*.

From an examination of the General Summary of Diseases and Ages, (p. 183), we observe that the age at which most deaths have been registered from this cause, is from 35 to 80; but more deaths occurred from 55 to 60 than at any other quinquennial period. It is remarkable that, up to the 55th year, the females predominated in every instance; up to that age the sexes are 100 males to 161·55 females;—out of 2,290 cases after 55 the order is reversed, and in every instance the males are most numerous—the sexes being 100 males to 70 females.

Cancer is said to prevail in particular localities. Its provincial comparison with the deaths from all causes are 1 in 270·87 in Leinster; 1 in 540·71 in Munster; 1 in 197·41 in Ulster; and 1 in 387·21 in Connaught. In proportion to the general mortality its peculiar habitats seem to be the counties of Wicklow, Londonderry, and Down, and the town of Carrickfergus. *Aillse* (the unconquerable disease), applied to this affection in the Gaelic tongue, might well be adopted in all modern nosologies.

No. 80. TUMOUR.—This term, still retained in our modern nosological tables, is vague and indefinite, not only on account of the variety of tumours—some of a benign and others of a maligant nature, to which the human body is subject, but from the meaning applied in popular phraseology to this word as descriptive of a cause of death. Thus "*a tumour*" is by the generality of persons as frequently used to denote a swelling or tumefaction, either acute or chronic, the result of inflammation—such as an abscess or a hydrocele—as it is to designate any morbid growth.

The deaths registered from this cause are 78—50 males and 28 females; 49 of which, 30 males and 19 females, happened in hospital, and are those on which, in this instance, most reliance is to be placed. The ages specified extend from a month to 90 years, but the middle period of life has afforded the greatest number of deaths; and in the hospitals from 30 to 45 in particular. At the early ages, phlegmonous tumours probably were the grounds on which these cases were returned. "A lump" was a constant cause of death specified in the A. Forms.

In the original language of the country, the same error, as that which I have already explained in the modern tongue, exists with respect to the nomenclature of this affection; for *Meall* is equally applied to a lump containing pus or fluid of any description, an anthrax, or an acute or chronic abscess, as it is to a wen, a fibrous, or an osteo-sarcomatous tumour.

Under this head may be classed *goitre* or *bronchocele*, of which mention is made in the early MSS., as *Meall* or *Neascoid Leanna fuair*, a cold or uninflamed lump, in contradistinction to an abscess or phlegmon; and also *Meall Braghad*—a cold lump in the neck; and that such was the original meaning of these words, may be gathered from the context in the MSS.; for *Napta*, the old Latin expression for tumours of this description, is likewise employed. The term *Cnap*, which I have adopted in the nosology, is the most applicable word, as meaning an uninflamed lump.

No. 81. Abscess—is of too palpable a nature to have been often mistaken, though the exact cause of such—whether merely a symptom of, or the actual disease that ended fatally, must remain undetermined. 606 deaths have been recorded from this cause, 100 males to 56·18 females, 199 of which, 133 males and 66 females, took place in hospitals. Abscesses have proved fatal at every age, but chiefly from 15 to 60.

No. 82. Fracture—caused death in 540 instances, 100 males to 40·99 females; the great bulk of which, 445 cases, took place in the hospitals and sanitary institutions, 308 males and 137 females. These were mostly fractures of the extremities, simple and compound —they do not include any cases of fracture of the cranium. The greatest number of deaths from this class of accidents (which should perhaps find a more correct locality among the ensuing division, that of sudden or violent deaths), occurred from 15 to 60 years of age; but deaths of persons as young as 7 months and as old as 90 years, have been recorded. The greater exposure of the males will account for the manifest disproportion of the sexes in this cause of death. Compared with all the violent deaths (with the exception of executed), this is 1 in 82·94 of the entire.

No. 83. Compound Dislocation—proved fatal in 18 instances, 12 males and 6 females. These deaths have been all returned by the hospital forms; but the particular joint which was the seat of the injury has not been stated, nor whether the immediate cause of death arose from the shock, the hæmorrhage, tetanus, or the subsequent inflammation and fever.

No. 84. Debility, and Old Age—include cases of wasting, decline, and decay (after 50 years of age), of atrophy, and decay of nature, or of debility as afforded by the medical returns, under which are registered 61 cases up to the 50th year. The age at which senectitude, climacteric disease, or the natural debility from age, and the gradual and general decline of the powers of life occur, not only differs in particular countries, and among particular races of the human family, but likewise in individuals. How frequently do we hear the expressions, "become an old man" and "premature old age," "wasting away," and "walking into the grave," applied to persons little past the middle period of the age now assigned to man. There is perhaps, properly speaking, no precise time at which man in any country, or under any circumstances, can be said to die of *pure old age,* uninfluenced by disease; or if such a period does exist, it has not yet been defined; or if it ever shall be defined, the exceptions, to meet the circumstances of individual cases, must far exceed the rule. Thus, we see one man hale and energetic at 65, and another tottering to the grave at 10 years younger; the latter to all appearance equally with the former free from disease. Few of the present generation die of old age, in the fullest meaning of that term; and, says Mr Farr, "there is reason to believe that many of the diseases of the aged are not detected; and that the terms 'old age' and 'natural decay,' are often incorrectly assigned as the cause of death." From the 50th to the 90th year and upwards, 206,312 deaths have been registered under this head, the sexes being 100 males to 99·15 females. Of these cases, which may be said to have died without any apparent or manifest morbid action going forward, (and which only differed from those returned "Causes not specified," at similar periods of life, in that the latter implies some morbid process,) we find the sexes varying slightly at the different ages; but the average age at which death took place from the 50th year upwards, where no actual disease presented, is from 66 to 70 in both sexes taken together. The proportion of these deaths to the general mortality in the districts is 1 in 5·03 in the rural, and 1 in 9·01 in the civic. 627 died in hospital. Compared with the total deaths from all causes this item in our tables appears to be 1 in 5·74 in the entire kingdom.

The total deaths registered under the sporadic diseases of uncertain seat amount to 238,678, as 100 males to 94·4 females, being in proportion to the general mortality from all causes of death during the ten years, 1 in 4·97.

The gross total of the deaths from the sporadic diseases amounts to 671,960, or as 100 to 56·73 of those of the epidemic class. The proportion of sexes in this class is 100 males to 95·02 females; in the epidemic class, 100 males to 92·93 females, and in the following class—the violent or sudden deaths—100 males to 49·3 females.

No. 85. Burns and Scalds—destroyed 4,349 persons, as 100 males to 123·82 females. During the first 12 months, and from the first to the end of the 5th year, the sexes are nearly equal. After the 5th year, this proportion alters, and with two exceptions, when they are equal (and the numbers in these cases are very small), the female deaths invariably predominate at every age from 5 to 90, and upwards. The first may be accounted for by the equal liability of young children of both sexes to accidents of this description; and the second, not only by the greater liability of females to the effects of fire or boiling fluids, and the greater combustibility of their dress, but to the increased mortality of that sex, owing to the constitutional shock being far greater in women than men. The age at which the great majority of these deaths occurred was from the 12th month to the end of the 10th year. The proportion of these cases to the general mortality of their respective districts is 1 in 292·18 in the rural, and 1 in 434·45 in the civic; and to the total violent deaths 1 in 11·26 in the former, and 1 in 14·69 in the latter. But as 690 deaths took place in the hospitals, of which 682 happened in the infirmaries and general hospitals located in the towns of the civic districts, it increases the mortality in these places from this cause to 1 in 224·5 of their total deaths, and 1 in 7·43 of the deaths from all violent causes, execution excepted in both instances.

The localities where most deaths from *burns and scalds* took place, in proportion to their general mortality, were the towns of Haroldscross (Co. Dublin), Ballymony, Belfast, Carrickfergus, and Ballina.

No. 86. DROWNED.—7,072 deaths are recorded from this cause, occurring in the sea or in inland lakes and rivers; they were chiefly accidental. Some having been returned "found drowned," on the verdict of coroners' juries, may have been either cases of homicide or self-destruction.—(See Coroners' Inquests, page li.) But in cases of suicide by drowning, the deaths have been registered "Suicide." The sexes in this casualty present a great inequality, being 100 males to 29·45 females. The proportion of this to all causes of death is 1 in 166·17 in the rural, and 1 in 148·21 in the civic district; and to all violent or sudden deaths, 1 in 6·4 in the former, and 1 in 5·13 in the latter. In the provinces, the first order of these proportions is 1 in 172·54 in Leinster; 1 in 167·69 in Munster; 1 in 168·6 in Ulster; 1 in 160·45 in Connaught; and in all Ireland, 1 in 167·89.

These casualties have occurred most frequently in the counties of Longford, Westmeath, and Roscommon, which are situated inland, and remarkable for the quantity of water they contain in lakes, rivers, and canals; and in those bounded by the sea, the counties of Donegal, Waterford, and Wexford, afforded most deaths by drowning. Six cases, 3 males and 3 females, the bodies having been carried to hospital, or the persons having died there subsequently from exhaustion, &c., have been afforded by the returns of the hospitals and sanitary institutions. Instances of drowning have been furnished by the A. forms, at all ages, from 1 month to 90 years; but the periods at which the greatest number of these deaths happened was from the first to the end of the 30th year, and from that to the 60th.

No. 87. INTEMPERANCE.—The immediate or subsequent effects of intoxicating liquors, either directly producing death, or reducing persons to that condition that they died from cold and exposure, or were rendered so liable to those accidents of various kinds of which they died, that their friends, or a coroner's jury, afforded this return, which amounts to 1,239, or 1,043 males and 196 females.* 1,129 of these cases have been the subject of legal investigation.—(See Report on Coroners' Inquests, page l.) There want not records in the history of this country, for the last two centuries, to prove that the habit of excessive indulgence in fermented liquors has been one of the crying evils of the land. Stanihurst and Dymmok alluded to this baneful practice in Ireland in the 15th and 16th centuries. In the year 1724 the pernicious use of ardent spirits became so manifest in the city of London, that the College of Physicians there put forward a public manifesto, detailing its calamitous consequences. "It is also to be observed," says Rutty, in his Natural History of the County Dublin, "that with us in Dublin the use of sprituous liquors, nearly from the same fatal era, (1724,) began to prevail, and from thence to the present time hath gradually prevailed to a most enormous degree." At that day an opinion was entertained by the learned, that the immoderate use of spirits, independent of its degrading effects upon the morals of the people, materially influenced their fecundity, and the general health of the community. Thus, says the author from whom I have just quoted, "It is no less certain, from observations on the baptisms in Dublin, not for seven or ten years only, but for forty-one years, that the proportion of the masculine part of the human race to the feminine, hath been also gradually decreasing ever since the same enormous use of spirituous liquors in this city; so that it is no rash conclusion in Dr Stephen Hales, that it debases the breed of mankind, having had its rise with the introduction, and continues to keep pace with the progress of this pernicious practice, which continues still to prevail among the lower class, who, till debauched by these liquors, used to supply us with a vigorous race of labourers, soldiers, and mariners, but will cease so to do, unless some additional legal restraint be laid upon the use of this poison. Sir William Petty formerly remarked of this country in general, that the number of ale-houses to the number of other houses, was almost one-third; and from a computation of the city and liberties of Dublin, taken in 1749, at a medium for some years preceding, the number of public-houses was as follows:—Of ale-houses, 2,000; taverns, 300; brandy-shops, 1,200;—total, 3.500,—which was near Sir William Petty's proportion; a very large one truly, and what gives too strong an evidence of our being deeply immersed in the reigning vice of the northern nations." And so keenly did Dr Rutty feel the demoralizing effects of this drunken condition of the Irish nation in his day, that, in addition to these and other remarks upon the same subject, he drew up a table "exhibiting the number of deaths from the bills of mortality, in two instances of suicide:—I. Premeditated self-murder. II. By excessive drinking, chiefly of drams." In the first of these he shows, that in 41 years, from 1726 to 1766, inclusive, the suicides were but 20, and the deaths caused by intoxication 78, during the same space of time; but he continues, "the instances of deaths from drinking drams, in this table, are to be understood only of those beasts in human shape, who, by great draughts of these liquors, manifestly kill themselves on the spot; not taking into account the far greater number who never came under public notice, to whom they are more slow. But, when the drinking of drams comes to be inserted, we quickly find our deaths from that occasion greatly multiplied; and if the Legislature do not interpose to check the progress of this evil, it is hard to say what the consequences must be."

This baneful thirst for intoxicating drinks appears to have gone on increasing to an extent that can hardly be credited, (and will, it is to be hoped, be scarcely believed in future ages,) from the days of Rutty to almost the present time; for when we sum together the deaths caused directly by the excessive use of spirits—the 77 deaths enumerated under the head of delirium tremens—the number of cases of lunacy that were induced by the same evil—and the vast multitude of accidents that have been the result of drunkenness,—then, I think, the loss of life caused by the use of ardent spirits, within the 10 years, cannot fall short of 2,000, independent of the number of diseases induced, or rendered fatal, by its previous injurious effects upon the constitution, and the train of want, misery, sickness, and destitution, entailed upon the wretched families of those persons who were its unhappy victims. From the records furnished by the Census inquiry, it appears that this description of death increased rapidly from the year 1831 to 1839. Happily a new and better state of things has commenced, the effects of which had already began to tell, in the two last years over which this inquiry extends; and, compared with the days of Rutty, (1772), our improvement is evident, for by the Dublin Police Report for the year 1841, it appears that there were only 880 public houses and taverns, and 112 grocers, who retail spirits by permission of the Customs, which, with 106 unlicensed houses and "grocers' shops, that retail spirits without a license," amounting in all to but 1,098, presents, in proportion to the population of the metropolis at the present day, an astonishing decrease in places of this description, since 1749. Including the cases of delirium tremens with the deaths from intemperance, during the 10 years ending 6th June 1841, it affords a proportion of 1 in 33·77 of all the total violent and sudden deaths, and 1 in 902·25 of the general mortality of the kingdom from all causes.

For the details of these deaths, and the localities where they prevailed most, see Report upon Coroners' Inquests,—the article Intemperance, pages l. and li.

How much still remains to be effected in the cause of temperance, may be learned from the fact of 13,204 persons, 7,544 males and 5,660 females, having been taken up for being drunk in the streets of Dublin during the year 1841.

The great majority of cases in the returns having been abstracted from the records of Coroners' Inquests, the ages are not specified. Of 302 cases afforded by the A. Forms and hospital returns, in which the age was mentioned, 8 were under 5 years. This may at first sight appear extraordinary, but is explained by the fact of the lower orders frequently administering whisky, even to new-born infants in case of illness. These deaths come, therefore, under the head of poisoning by the improper and immoderate administration of ardent spirits. Spasm of the glottis, and consequent suffocation, is a well known consequence of pouring whisky down the throats of young children. From 5 to 15 years of age, 32 deaths took place; from 15 to 30,—73; from 30 to 50,—136; and after 50,—53. Dr Speer, in his essay on the Diseases of the lower orders in Dublin, in 1822, says that "in the entire mass of misery of our poor, whisky is thought to form the principal remedy; they conceive it to be a cure for all complaints, and all weathers; in warm weather it allays their thirst; when cold it heats them; when wet it dries them; in sorrow they fly to it as a charm and a blessing, and in its intoxicating draughts their misery is forgotten. The bad effects, however, resulting from this fluid with us are not, I think, to be ascribed to the quantity consumed. I believe the lower orders in Manchester, Edinburgh, Glasgow, and some of the large manufacturing towns in Great Britain, consume a greater quantity; but there is a striking difference in the mode of consumption between the two; they do not take it on empty stomachs like our people; they eat much more solid nourishing food; thus the effects of the whisky are less directed to the coats and nerves of the stomach, or to the brain; and therefore intoxication does not exhibit itself so frequently." I have quoted this passage for its truth, its applicability to the state of things in the present day, and because there have been a sufficient number of cases reported of the effects of drinking whisky, under the circumstances detailed by this very intelligent writer, to explain the cause of a number of these deaths. The dram drinking in the early morning has been one of the most pernicious effects of this fatal epidemic among the working classes in Ireland (in the larger towns in particular) for the last century.

No. 88. HOMICIDE.—Under this term are included all those instances of death which, whatever may be the moral or the legal guilt attached to them, have been (unaccidentally) caused by the hand of man. Infanticide, murder, manslaughter, justifiable homicide, or persons killed by others in self-defence, are all summed here together in the general table of deaths, and their details exhibited in those for coroners' inquests; as in a medico-statistical point of view, they may be all classed together, no matter what their crimes or how committed.

The total deaths from this cause amount to 3,508, the sexes being 100 males to 27·84 females. Of these, 526 males and 410 females, in all 936, were cases of infanticide, occurring in new-born infants, and 5 in children from the 1st to the 12th month, inclusive. 1,028 males and 260 females, having been afforded by the returns of coroners' inquests, the age at which death took place cannot be stated; but of those whose ages are specified after the 1st year, the greatest number occurred between the 15th and 30th years, and the next most fatal period has been from the 30th to the 50th year. In proportion to their respective populations, this form of death has prevailed less in the rural than the civic district, as 100 of the former to 199 of the latter. This is the only cause of death not recorded by the hospital returns; not that many of these deaths did not take place in these institutions, but because inquests having been held upon all such cases of violent death, they have been added to the registries of their respective localities, in counties and districts; and moreover, such deaths have not been returned in the hospital records by their *crimes*, as murder and manslaughter, &c., but by the injuries inflicted, or the immediate cause of death, as by poison, gun-shot wounds, &c. &c. In comparison with all the violent or sudden deaths, these returns are 1 in 12·66, and with the general mortality from all causes 1 in 310·05 in Leinster; 1 in 247·21 in Munster; 1 in 546·46 in Ulster; 1 in 453·02 in Connaught; and 1 in 338·47 in the entire kingdom.

We learn from the census returns that this form of death has decreased rapidly during the last 5 years over which our inquiry extends. Thus, from June 1831, to June 1836, the average deaths were 388 per annum, and from June 1836, to June 1841, but 314 per annum.

For the localities where this form of death has prevailed most, see page xlix.

No. 89. STARVATION.—The man who dies from want of food, may be said to have wanted every other necessary also; and those who die from cold and exposure, unless in cases of accidents and in great extremes of temperature, may likewise be said to want sufficient food and covering; so that perhaps the term *destitution*, or *want and destitution*, might be more applicable to this form of death, by which 117 lives, 74 males and 43 females, were lost. One of these cases has been recorded at so early an age as the 3d month, and 13 during the 1st year. Cases of starvation have been registered from the returns at almost every age—79 of them took place in the rural district, or 1 death in 11,539 of the general mortality of the open country, and minor towns and villages; 18 in the civic, or 1 in 13,009 of the deaths in towns of or above 2,000 people; and 20 occurred in hospital; the patients having been admitted when suffering from want of food, or in such a destitute condition as subsequently produced death from exhaustion. Including the deaths in hospitals with those in the civic districts, to which they properly belong, it appears that the deaths from want and destitution in the larger towns have been 1 in 7,240 to the total mortality of these places. During the first 5 year period, these deaths were on an average but 6 per annum, and in the last 5 year period (that ending June 1841,) they had increased to the yearly average of 18.

No. 90. EXECUTED.—197 lives, 188 males and 9 females, have been forfeited to the laws during the ten years ending June 1841. A comparison of the first and second 5 year periods shows that the average annual executions were 31 in the former, and but 8 in the latter. It would appear from these returns that the age of crime in this country is from 16 to 40, for 179 of the entire number of executions took place between these periods; 18 from 15 to 20; 68 from 20 to 25; 52 from 25 to 30; and from 30 to 40,—41—the most marked period in the age of crime being from 20 to 25.

The records of the different jails in Ireland have afforded the following returns for the ten years specified. These tables exhibit the years and localities in which the executions have taken place, and the ages, sexes, and occupations of the persons executed.

## TABLE I.—YEARS AND LOCALITIES.

| YEARS. | | PROVINCE—COUNTY OR CITY. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LEINSTER. | | | | | | | | | | | | | | | | MUNSTER. | | | | | | | | | | ULSTER. | | | | | | | | | | | CONNAUGHT. | | | | | | | |
| | | Carlow. | Drogheda. | Dublin City. | Dublin. | Kildare. | Kilkenny City. | Kilkenny. | King's. | Longford. | Louth. | Meath. | Queen's. | Westmeath. | Wexford. | Wicklow. | Total. | Clare. | Cork City. | Cork. | Kerry. | Limerick City. | Limerick. | Tipperary. | Waterford City. | Waterford. | Total. | Antrim. | Armagh. | Carrickferg. | Cavan. | Donegal. | Down. | Fermanagh. | Londonder. | Monaghan. | Tyrone. | Total. | Galway Town. | Galway. | Leitrim. | Mayo. | Roscommon | Sligo. | Total. | General Total. |
| 1831–2 | M. | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... | ... | 4 | ... | ... | ... | 8 | 15 | ... | ... | ... | ... | ... | 10 | ... | ... | 25 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | 2 | ... | ... | ... | ... | 1 | 1 | 2 | 37 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 3 |
| 1833 | M. | ... | ... | ... | ... | ... | ... | 4 | 7 | ... | ... | ... | 3 | 3 | 2 | ... | 19 | 2 | ... | 4 | 1 | ... | 1 | 6 | ... | ... | 14 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 1 | ... | 3 | 36 |
| | F. | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| 1834 | M. | ... | ... | 1 | ... | 4 | ... | 3 | 2 | ... | ... | 6 | 6 | 2 | 1 | ... | 25 | 3 | ... | ... | 1 | ... | 2 | 1 | ... | ... | 7 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | 2 | ... | 1 | ... | 2 | 5 | ... | 8 | 42 |
| | F. | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 1835 | M. | 1 | ... | ... | 1 | ... | ... | 1 | 2 | ... | ... | 1 | 3 | ... | 1 | ... | 10 | 1 | ... | 1 | ... | ... | 4 | 2 | ... | 2 | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 2 | ... | 4 | ... | 1 | ... | 2 | 7 | 29 |
| | F. | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 1836 | M. | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | 1 | ... | 1 | 4 | ... | ... | ... | ... | ... | ... | 5 | ... | 2 | 7 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 12 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1837 | M. | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | ... | ... | 6 | ... | ... | 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 1838 | M. | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1839 | M. | 1 | ... | ... | ... | 1 | ... | 1 | 1 | 2 | ... | ... | 1 | ... | ... | ... | 7 | ... | ... | ... | ... | ... | ... | 4 | ... | 2 | 6 | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | 2 | ... | 1 | 1 | ... | ... | ... | 2 | 17 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1840 | M. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1841 | M. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | 1 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| Total | M. | 4 | ... | 1 | 1 | 5 | 1 | 13 | 14 | 2 | ... | 7 | 17 | 8 | 4 | 1 | 78 | 21 | ... | 5 | 3 | ... | 7 | 34 | ... | 8 | 78 | ... | ... | ... | 3 | 1 | 3 | ... | ... | ... | 2 | 9 | ... | 9 | 1 | 3 | 7 | 3 | 23 | 188 |
| | F. | 1 | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | 1 | ... | 1 | ... | 2 | ... | ... | 4 | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 9 |
| Total M. & F. | | 5 | ... | 2 | 1 | 5 | 1 | 13 | 15 | 2 | ... | 7 | 17 | 8 | 4 | 1 | 81 | 21 | ... | 6 | 3 | 1 | 7 | 36 | . | 8 | 82 | ... | ... | ... | 3 | 1 | 4 | * | ... | 1 | 2 | 11 | ... | 9 | 1 | 3 | 7 | 3 | 23 | 197 |

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* 1 Female sentenced to death in 1838 strangled herself.

## TABLE II.—AGES AND OCCUPATIONS.

| Ages. | | Occupations. | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bakers. | Butchers. | Cabinet-makers. | Carpenters. | Coopers. | Cutlers. | Dealers. | Farmers. | Hatters. | Huxters. | Labourers. | Servants. | Shoemakers. | Soldiers. | Spinners. | Tailors. | Weavers. | Unspecified. | Total. |
| 16 to 20 | M. | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 13 | ... | ... | ... | ... | ... | 1 | 3 | 18 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 21 to 25 | M. | ... | 1 | ... | 1 | ... | ... | 1 | 3 | 1 | ... | 49 | ... | ... | ... | ... | ... | ... | 11 | 67 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 |
| 26 to 30 | M. | 2 | ... | ... | 2 | 1 | ... | ... | 6 | ... | ... | 28 | 3 | ... | 1 | ... | 3 | ... | 4 | 50 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | .. | 2 |
| 31 to 35 | M. | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | 17 | ... | 1 | 1 | ... | ... | ... | 2 | 25 |
| | F. | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | 2 |
| 36 to 40 | M. | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 8 | 1 | ... | ... | ... | ... | ... | 2 | 12 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | 2 |
| 41 to 45 | M. | ... | .. | ... | 1 | ... | ... | ... | 2 | ... | ... | 3 | ... | ... | ... | ... | ... | ... | 1 | 7 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 |
| 46 to 50 | M. | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | 4 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | .. | ... | ... |
| 51 to 55 | M. | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 2 | .. | ... | ... | ... | ... | ... | ... | 4 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... |
| 56 to 60 | M. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | F. | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 61 to 65 | M. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| | F. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total | M. | 2 | 1 | 1 | 4 | 1 | 1 | 1 | 18 | 1 | ... | 123 | 4 | 2 | 2 | ... | 3 | 1 | 23 | 188 |
| | F. | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | 2 | ... | ... | 2 | ... | ... | 3 | 9 |
| Total M. & F. | | 2 | 1 | 1 | 4 | 1 | 1 | 1 | 19 | 1 | 1 | 123 | 6 | 2 | 2 | 2 | 3 | 1 | 26 | 197 |

From these tables we learn that in the years 1831, 1832, 1833, 1834, and 1835, nearly four-fifths of the entire number took place; that in the province of Leinster the executions were to the average population between 1831 and 1841, 1 in 23,971; in Munster, 1 in 28,190; in Ulster, 1 in 212,408; in Connaught, 1 in 60,060; and that, upon the same calculations, the greatest number of executions have taken place in the counties of Clare, Tipperary, King's and Queen's.

From Table II., "Ages and Occupations," we learn that 123 were labourers and 19 farmers, which, from the similitude of the employments, may be classed together, and they form about four-fifths of the entire of the specified occupations—6 were servants, 4 males and 2 females; 4 carpenters and 3 tailors.

No. 91. Accidental Poisoning.—The deaths from this cause amount to 139, or 74 males and 65 females. 89 occurred in the rural, and 37 in the civic district; and 13 in the hospitals and sanitary institutions. In 54 instances the ages have not been specified. Deaths have, however, been recorded at every age up to 55, and 1 female 75 to 80.

The proportion to the total violent deaths is 1 in 319·74, and to the general mortality, 1 in 8,542·25.

No. 92. SUICIDE.—A return of 792 deaths of self-murder has been afforded by the census inquiry, the sexes being in the proportion of 100 males to 59·35 females; the immediate means of destruction, and the seasons and years in which 755 of these deaths took place are detailed at page 1. and statistically arranged in the tables of coroners' inquests. 499 suicides were committed in the rural districts, or 1 in 70·46 of the sudden and violent deaths, and 1 in 1,826·89 of the general mortality;—and 1 in 14,111·79 of the *population* of the open country, including the minor towns and villages. 30 deaths from suicide occurred in hospitals, which, added to 263 in the civic districts, where such institutions are located, affords a proportion of 1 in 30·99 of the sudden or violent deaths, 1 in 935·57 of the general mortality, and 1 in 3,868·04 of the *population* of the towns and cities containing 2,000 inhabitants or upwards. In the rural districts the sexes are 100 males to 63·6 females, and in the civic, 100 males to 52·6 females. In 123 instances, where a return of the ages was afforded, we find that 7 occurred at or under 15; from 15 to 20—9; from 20 to 30—26; from 30 to 40—30; from 40 to 60—41; above 60—10, two of which occurred from 75 to 80 years of age. The average annual amount of suicides is 71·4 in the first, and 87 in the second 5 year period, showing an increase of 15·6 per annum in this form of death.

No. 93. ACCIDENTAL UNSPECIFIED.—Under this head 27·032 deaths have been registered, 100 males to 52·37 females. They have occurred at all ages, from birth to 90 and upwards. During the 1st year 5,571 deaths occurred, the sexes being nearly equal; from the 1st to the end of the 5th, 4,806, the males predominating as 100 to 88·44; from the 5th to the 15th, 3,329, the males still further increasing as 100 to 62·46: from the 15th to the 30th, 4,860, the males taking the lead to yet greater extent, 100 to 25·67; from 30 to 40, 4,860, as 100 males to 26·78 females, and after 50, 3,759, as 100 males to 43·74 females. The proportion of unspecified accidental deaths to the total violent or sudden deaths is 1 in 1·56 in the rural, and 1 in 1·97 in the civic, including the hospitals and sanitary institutions.

The total violent or sudden deaths amounted in all to 44,445, as 100 males to 49·3 females. Compared with the general mortality we find this class 1 in 30·25 in Leinster; 1 in 21·45 in Munster; 1 in 34·11 in Ulster; 1 in 25·16 in Connaught; and 1 in 26·71 in the country at large. 35,164 of these deaths occurred in the rural district, or 1 in 25·92 of the general deaths of the open country, and 1 in 29·54 of the towns of or above 2,000 inhabitants, including the deaths in hospitals. The returns of violent or sudden deaths are to the deaths from epidemic diseases 1 to 8·57, and to the sporadic diseases, including those where the cause of death has not been specified, 1 to 17·13.

No. 94. CAUSES NOT SPECIFIED.—The deaths registered under this head amount to 89,720, as 100 males to 83·31 females, or 1 in

13·23 of the entire deaths. Of these 68,286 were returned by the rural district, or 1 in 13·35 of the total deaths of the open country; and 12,179 by the civic, exclusive of the hospitals, or 1 in 19·22 of the towns of 2,000 population and upwards; and 9,255 by the hospitals and sanitary institutions, or 1 in 4·49 of the deaths of these institutions—a circumstance which, it is to be hoped, from the general spread of medical knowledge, the great value at present assigned to statistical information, and an improved condition of the registries in hospitals, will not appear in any subsequent inquiry into the state of these establishments.

During the first 12 months the cause of death was not assigned in 44,317 instances; from the first year to the end of the 10th, 16,134; from 10 to 20, 4,714; from 20 to 50, 16,104; and after 50, 6,313.

The total deaths from all sources for the entire kingdom, registered from the census returns, and which purport to be the deaths of the families from whom these returns were received, during the ten years ending the 6th June 1841, amount to 1,187,374, in the proportion of 100 males to 91·24 females: of which number, 911,619 occurred in the open country, including the minor towns and villages, the sexes being 100 males to 91·04 females. 234,173 deaths took place in the civic district, as 100 males to 94·05 females; and 41,582 deaths in the different hospitals and sanitary institutions, in the ratio of 100 males to 80·67 females; but as 39,950 of these deaths occurred in those hospitals which were situated in the towns that form the civic districts, it increases the mortality of these places to 274,123, or 1 in 4·14, and the sexes to 100 males to 91·93 females; and the remainder added to the rural district, in which the hospitals where they happened are located, raises its mortality to 913·251, or 1 in 7·7, and the sexes to 100 males to 91·03 females.

That these 1,187,374 are not *all* the deaths that occurred in Ireland for ten years is manifest. Such information, without a proper annual registration of the kingdom, it was not possible, under the circumstances, to obtain; and what portion of the total decennial mortality of the country they are, can only be supposed; for they differ in value if not every year at least during the first and second 5 year periods. This, however, was naturally to be expected; and their not being given as the *total* deaths of that period, nor as a *whole* intended, strictly speaking, as bills of mortality, it remains but to say, in what least objectionable form, or for what precise period, an approximation to an annual mortality can be made for different localities, or the entire collectively. Taking an average population between the census of 1831 and 1841, and the average of the entire deaths returned upon the present inquiry for that period, we find the annual proportion of deaths to the living to be 1·48 per cent., or 1 death in every 67·13 of the population. Supposing, then, the *actual annual mortality* in this country to be 2 per cent., or 1 in 50, in round numbers, then these deaths are, as a whole, minus about one-fourth.

Even supposing all the deaths were registered, and that these calculations were correct, still, from the alteration in the boundaries of different localities since the census of 1831, it would not be possible to arrive at any approximation to the individual mortalities of even counties. When, however, we calculate an annual mortality on the like averages for the second 5 year period, that is, from the middle of 1836, to the 6th June 1841, we find it increased to 1·69 per cent. or 1 in 59·74;—not from any increase of the actual mortality of that period over the earlier one, but on account of the death returns being more numerous as we approach the time when the inquiry was instituted in 1841. If then the value of these returns increase with their proximity to the date of the inquiry, the year 1840 must, it would at first sight appear, afford the best period on which to ground a comparison between the deaths and the living; but although the deaths of that year may be correct, the number of the population can only be arrived at by calculation, and that calculation must be to a certain extent defective, from the inability of knowing how many of the births of 1840 died from the 1st of January to the 6th June 1841, the nature of the returns not permitting of a monthly registration. Under these circumstances, the nearest approximation to an annual mortality appears to be, by adding together the deaths returned for so much of the year 1841 as had elapsed prior to the taking of the census, half the deaths of 1840, and (presuming that we have thus got the deaths from 1st July 1840, to 6th June 1841, and require only those of the 24 days from the 7th to the 30th June 1840, to complete the year) $\frac{24}{366}$ or $\frac{4}{61}$, of the latter also. It must, however, be borne in mind, that while the deaths of 1841 are those of the spring of that year, those of 1840 are the half of both spring and autumn taken together. By this means the number of living are more accurately ascertained, and it would naturally be expected that as these death returns have been more or less a matter of memory, a greater number would be remembered for the last than for any previous years, by the population from whom the returns were received. Thus in the county of Antrim the population was 276,188 on the night of the 6th June 1841—the deaths returned for the 5 months and 6 days of 1841, were 2,222; half the deaths of 1840, were 2,019, and these, with $\frac{4}{61}$ of the latter year added, to complete the annual period, give 4,505. The mortality thus arrived at will be 1·63 per cent. or 1 in 61·3.

This explanation will exhibit the value to be attached to the following table of proportionate mortality; and the average age, or mean point, at which death occurred in each county and province in Ireland.

| County, City, or Town. | Rural District. | | | Civic District. | | | Rural and Civic. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Per Cent. | 1 in | Average age at which death occurred. | Per Cent. | 1 in | Average age at which death occurred. | Per Cent. | 1 in | Average age at which death occurred. |
| **Leinster.** | | | | | | | | | |
| Carlow, | 1·48 | 67·26 | 32 to | 2·33 | 42·85 | 21 to 22 | 1·62 | 61·53 | 29 to |
| Drogheda Town, | ... | .. | ... | 2·22 | 45·04 | 6 | 2·22 | 45·04 | 6 |
| Dublin City, | ... | ... | ... | 3·11 | 32·12 | 20 | 3·11 | 32·12 | 20 |
| Dublin, | 1·97 | 50·7 | 15 – 16 | 2·54 | 39·38 | 16 | 2·07 | 48·09 | 16 |
| Kildare, | 1·65 | 60·31 | 27 – 28 | 2·26 | 44·21 | 18 – 19 | 1·7 | 58·74 | 26 |
| Kilkenny City, | ... | ... | ... | 2·91 | 33·75 | 12 | 2·91 | 33·75 | 12 |
| Kilkenny, | 1·60 | 62·63 | 29 | 2·28 | 43·66 | 16 – 17 | 1·63 | 61·21 | 28 |
| King's, | 1·69 | 59·11 | 25 – 26 | 2·51 | 39·75 | 12 | 1·78 | 56·03 | 24 |
| Longford, | 1·72 | 57·8 | 23 | 1·95 | 51·2 | 11 – 12 | 1·74 | 57·34 | 22 |
| Louth, | 1·92 | 51·81 | 22 – 23 | 2·18 | 45·76 | 9 – 10 | 1·96 | 50·92 | 20 – 21 |
| Meath, | 1·83 | 54·36 | 25 | 3·29 | 30·33 | 11 | 1·93 | 51·65 | 24 |
| Queen's, | 1·66 | 60·04 | 28 | 2·49 | 40·04 | 22 | 1·74 | 57·24 | 27 |
| Westmeath, | 1·64 | 60·65 | 28 – 29 | 2·28 | 43·78 | 18 – 19 | 1·69 | 59·02 | 27 |
| Wexford, | 1·63 | 61·29 | 34 | 2·52 | 39·62 | 19 – 20 | 1·75 | 56·84 | 30 |
| Wicklow, | 1·67 | 59·69 | 24 – 25 | 3·22 | 31·01 | 11 | 1·77 | 56·28 | 23 – 24 |
| **Munster.** | | | | | | | | | |
| Clare, | 1·77 | 56·22 | 8 | 3·41 | 29·25 | 12 | 1·88 | 53·04 | 8 – 9 |
| Cork City, | ... | ... | ... | 3·03 | 32·98 | 16 | 3·03 | 32·98 | 16 |
| Cork, | 1·65 | 60·28 | 22 | 2·33 | 42·85 | 13 – 14 | 1·73 | 57·57 | 20 – 21 |
| Kerry, | 1·63 | 61·11 | 9 | 2·46 | 41·55 | 10 – 11 | 1·70 | 58·81 | 10 |
| Limerick City, | ... | ... | ... | 2·76 | 36·22 | 8 – 9 | 2·76 | 36·22 | 8 – 9 |
| Limerick, | 1·66 | 60·20 | 20 | 1·96 | 50·84 | 19 – 20 | 1·66 | 59·89 | 19 – 20 |
| Tipperary, | 1·68 | 59·35 | 24 – 25 | 3·24 | 30·8 | 14 | 1·93 | 51·6 | 21 |
| Waterford City, | ... | ... | ... | 2·95 | 33·84 | 10 – 11 | 2·95 | 33·84 | 10 – 11 |
| Waterford, | 1·67 | 59·8 | 25 | 2·57 | 38·78 | 14 – 15 | 1·79 | 55·72 | 22 – 23 |
| **Ulster.** | | | | | | | | | |
| Antrim, | 1·57 | 63·35 | 25 | 2·31 | 43·21 | 14 | 1·63 | 61·3 | 24 |
| Armagh, | 1·56 | 63·76 | 25 | 2·28 | 43·71 | 11 | 1·63 | 61·26 | 23 – 24 |
| Belfast Town, | ... | ... | ... | 2·85 | 35·05 | 9 | 2·85 | 35·05 | 9 |
| Carrickfergus, | 1·45 | 68·67 | 18 – 19 | 2·44 | 40·89 | 18 | 1·87 | 53·28 | 18 – 19 |
| Cavan, | 1·7 | 58·77 | 30 | 3·37 | 29·65 | 20 | 1·75 | 56·67 | 20 |
| Donegal, | 1·6 | 62·42 | 22 | 2·33 | 42·84 | 24 | 1·61 | 61·79 | 23 – 24 |
| Down, | 1·51 | 66·06 | 20 | 2·22 | 44·96 | 14 | 1·58 | 62·99 | 27 |
| Fermanagh, | 1·56 | 64·08 | 24 | 2·62 | 38·16 | 12 – 13 | 1·59 | 62·54 | 23 – 24 |
| Londonderry, | 1·48 | 67·85 | 28 | 2·61 | 38·24 | 14 | 1·6 | 62·11 | 25 |
| Monaghan, | 1·72 | 58·12 | 25 | 2·66 | 37·46 | 17 | 1·76 | 56·68 | 24 – 25 |
| Tyrone, | 1·5 | 66·64 | 28 | 2·22 | 44·9 | 14 | 1·53 | 65·18 | 26 |
| **Connaught.** | | | | | | | | | |
| Galway Town, | ... | ... | ... | 3·82 | 26·17 | 6 – 7 | 3·82 | 26·17 | 6 – 7 |
| Galway, | 1·87 | 53·29 | 20 | 2·27 | 43·88 | 13 – 14 | 1·89 | 52·77 | 19 – 20 |
| Leitrim, | 1·8 | 55·3 | 17 – 18 | ... | ... | ... | 1·8 | 55·3 | 17 – 18 |
| Mayo, | 1·64 | 60·72 | 6 | 2·05 | 48·76 | 6 | 1·66 | 59·97 | 6 |
| Roscommon, | 1·81 | 55·19 | 13 – 14 | 2·82 | 35·39 | 16 – 17 | 1·85 | 54· | 14 |
| Sligo, | 1·56 | 63·82 | 10 – 11 | 2·78 | 35·91 | 8 – 9 | 1·66 | 60·17 | 10 – 11 |
| **Summary.** | | | | | | | | | |
| Leinster, | 1·71 | 58·32 | 26 | 2·81 | 35·53 | 18 – 19 | 1·96 | 50·99 | 23 – 24 |
| Munster, | 1·67 | 59·55 | 20 | 2·79 | 35·78 | 13 | 1·86 | 53·78 | 18 |
| Ulster, | 1·57 | 63·44 | 25 | 2·57 | 38·9 | 12 – 13 | 1·58 | 63·03 | 23 – 24 |
| Connaught, | 1·75 | 56·98 | 13 – 14 | 2·71 | 36·82 | 8 | 1·8 | 55·27 | 12 – 13 |
| **Ireland,** | 1·66 | 59·89 | 22 | 2·75 | 36·33 | 15 | 1·81 | 54·94 | 20 – 21 |

From this we learn that according to the census returns the ratio of deaths to the living, for the year ending the 6th June 1841, was 1·81 per cent., or 1 in 54·94—nearly 1 in 55 in the entire kingdom; or adding the deaths and subtracting the births of the 5 months and 6 days of 1841, and calculating the mortality for the entire year 1840, (which being an unbroken period may, in some respects, be preferable) we find the population to be 8,094,893; *i. e,* 3,978,741 males and 4,116,152 females, and the deaths, 141,536, *i. e.* 73,260 males and 68,276 females. By the same steps we arrive at the following ratio of deaths to the living population for one year—that is, for 1840—

| PROVINCES. | RURAL DISTRICT. | | | | | | CIVIC DISTRICT. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Per Cent. | | | One in | | | Per Cent. | | | One in | | |
| | M. | F. | Tot. | M. | F. | Total. | M. | F. | Tot. | M. | F. | Total. |
| Leinster, | 1·72 | 1·58 | 1·65 | 57·86 | 63·21 | 60·43 | 3·05 | 2·35 | 2·67 | 32·73 | 42·38 | 37·36 |
| Munster, | 1·71 | 1·58 | 1·65 | 58·17 | 62·93 | 60·44 | 3·2 | 2·42 | 2·77 | 31·19 | 41·25 | 35·97 |
| Ulster, . | 1·51 | 1·39 | 1·45 | 66·11 | 71·88 | 68·93 | 2·77 | 2·15 | 2·44 | 36·04 | 46·36 | 40·94 |
| Connaught, | 1·72 | 1·66 | 1·69 | 57·96 | 60·17 | 59·04 | 3·18 | 2·35 | 2·74 | 31·4 | 42·4 | 36·44 |
| Ireland, . | 1·65 | 1·53 | 1·59 | 60·24 | 64·98 | 62·52 | 3·05 | 2·34 | 2·66 | 32·68 | 42·7 | 37·45 |

| PROVINCES. | RURAL AND CIVIC DISTRICTS. | | | | | |
|---|---|---|---|---|---|---|
| | Per Cent. | | | One in | | |
| | M. | F. | Tot. | M. | F. | Total. |
| Leinster, . | 2· | 1·76 | 1·88 | 49·83 | 56·57 | 53·07 |
| Munster, . | 1·94 | 1·73 | 1·83 | 51·52 | 57·63 | 54·44 |
| Ulster, . | 1·62 | 1·46 | 1·54 | 61·49 | 68·15 | 64·74 |
| Connaught, | 1·8 | 1·7 | 1·75 | 55·47 | 48·68 | 57·03 |
| Ireland, . | 1·84 | 1·65 | 1·74 | 54·3 | 60·28 | 57·19 |

This calculation becomes the more necessary as from the tables of deaths registered by ages, and in weeks and months for the metropolis during 2 years, appended to this report, (pages lxxiv. and lxxxii.) we learn, that the effects of climate and season alter the mortality in the following proportions in each of the four seasons, taking the average of the two years; spring, 1,911, summer 1,420, autumn 1,427, and winter 1,994; and dividing the year into two equal periods, and making the first of July the mean point, the deaths of the first half are to those of the second as 100 to 87·93.

This mortality, which, according to the first series of calculations, is nearly 1 in 55, and by the second, or that in the year 1840, is 1 in 57·19, may appear at first sight too small; it is, nevertheless, I am of opinion, but little short of the truth, especially when the circumstances of Ireland are considered in comparison with those of England, where in the period from 1821 to 1831, the annual average mortality was but 1 in 51; and by the present more accurate system of registration, it varies from 1 in 47, in the year 1839, to 1 in 44, in 1841, and the average of the entire period during which the registration act has been in force, is as low as 1 in 45. In England the bills of mortality for many years, and the lately published Sanitary Report upon the condition of the working classes in particular, show us that the ratio of deaths to the living varies from 1 in 64 in the agricultural districts and the open country, as in Herefordshire, to 1 in 28·33 in the densely populated manufacturing towns, such as Manchester, &c. To establish, then, a fair analogy between the mortality of the two countries, taking England as the standard, the proportion of Ireland which is analogous to, and its inhabitants similarly situated with, those of the working classes in Herefordshire, Dorset, or Cornwall, the healthy parts of England, on the one hand —and the proportion of this country, or its inhabitants similarly situated, with those of Leeds, Manchester, or Liverpool, the unhealthy parts of England on the other, must be all taken into account; and thus comparisons may be formed between the relative mortality of the two countries. The late Sanitary Report exhibits conditions of the population in the mining and manufacturing districts of England, such as are not to be found in this country; the infantile mortality in the most unhealthy parts of Ireland falls far short of that in some of the larger towns in England; and lastly, the proportion of violent or sudden deaths is 745 in every 100,000 of the population in the latter, and but 61·22 in 100,000, on an average of 5 years, in the former country.

These circumstances are put forward, not for the purpose of attempting to prove the validity of these tables of deaths, which are, no doubt, far short of the actual mortality of this country; but in order to show cause why the deaths of Ireland *should be,* from the present condition of this country, independent of climate, or other circumstances of that nature, less than those of England.

From an examination of the entire records of death, disease, and longevity, in this country, I am led to believe that, were an accurate registration effected, the *proportionate* annual mortality would not be found to exceed 1 in 52, or 1 in 53. According to the proportionate mortality exhibited in the foregoing table, we find that the counties of Ireland may be arranged in three classes. In the 1st class, which includes those of Tyrone, Down, Fermanagh, Londonderry, Donegal, Armagh, Antrim, Carlow, Kilkenny, and Sligo, the average proportionate mortality, or ratio of deaths to the living, in one year, is one in 62. In the 2d class, including the counties of Limerick, Mayo, Westmeath, Kildare, Kerry, Cork, Longford, Queen's, King's, Wexford, Wicklow, Cavan, Monaghan, Waterford, and Leitrim, the average is 1 in 57·5. And in the 3d class, including the counties of Clare, Dublin, Louth, Meath, Galway, Tipperary, and Roscommon, 1 in 51·7. In these calculations the specified cities are not included; their mortality, with the exception of Galway, offers a remarkable similarity—varying only from 1 in 32·12 in Dublin, to 1 in 35·05 in Belfast; and this fact of the high mortality in the larger towns, and among densely crowded portions of the population, or those under similar circumstances to the parts of England that raises its mortality, lends additional evidence to the opinion of the lower proportionate mortality in this country; for in the whole civic district it is 2·75 per cent., or 1 in 36·33; showing that one great cause of the superior healthiness, or less mortality in Ireland arises chiefly from the greater proportion of its rural to its civic district than the same portions of England. According to the last report of the Registrar-General, we find that Wales, (which, though not possessing towns of such magnitude as Ireland, yet as regards the condition of the population of its mining districts, is analogous to that of the people resident in the towns and cities of Ireland,) has a proportionate mortality of but 1 in 51.

In Ireland the proportion of deaths to the population of the open country, and the towns of and above 2,000 inhabitants, is 1 in 59·89 in the former, and 1 in 36·33 in the latter; and the relative mortality from particular classes of diseases, and the proportion of male to female deaths in the two districts has been already inquired into in the foregoing explanation of the nosology and the tables of deaths.

Independent of the cities of Dublin, Kilkenny, Cork, Limerick, and Waterford, and the towns of Drogheda, Belfast, Carrickfergus, and Galway—the following table shows the effect of density of population on sickness and mortality.

| DESCRIPTION OF LOCALITY. | Proportionate Mortality. | | | Average Age at which Death occurred. | | | Proportionate Mortality from particular Causes. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Epidemic Diseases. | | | Sporadic Diseases. | | | | Violent and Sudden Deaths. |
| | M. | F. | M. & F. | M. | F. | Males and Fem. | Fever. | Small Pox. | All Epi. Diseases | Nervous System. | Respi. & Circulat. Organs | Digestive Org. | Other Classes. | |
| | 1 in | 1 in | 1 in | | | | 1 in | 1 in | 1 in | 1 in | 1 in | 1 in | 1 in | 1 in |
| Towns of 2,000, & not exceed. 5,000, | 45·9 | 55·81 | 50·85 | 12 | 11 | 11 to 12 | 532·4 | 1697·4 | 134· | 525·8 | 350·6 | 480·5 | 309·1 | 1845·3 |
| Do. above 5,000, & not exceed. 10,000, | 39·89 | 51·08 | 45·24 | 11 | 11 | 11 | 439·2 | 830·6 | 110·6 | 433·7 | 340·9 | 371·3 | 30·63 | 1650·6 |
| Do. above 10,000, | 37·64 | 48·98 | 43·08 | 16 | 14 | 15 | 366·2 | 799·8 | 169·8 | 410·8 | 308·8 | 344·7 | 294·4 | 1475·7 |
| Open Country, | 74·06 | 81·2 | 76·93 | 22 | 21 to 22 | 22 | 864·3 | 1513·4 | 257·3 | 924·8 | 495·9 | 779·3 | 307·6 | 1945·5 |

The ages at which death is said to have occurred in the Census returns must, no doubt, be received with caution. They are, however, I am led to believe, a nearer approximation to the truth than similar returns for the living; many who would object to stating their own actual age would have no objection to record that of a deceased friend or relative. In these, as in most other returns of a similar nature, the ages invariably predominate at the quinquennial and decennial periods beyond what they in reality were, as the following table exhibits.

| Ages. | Number of Deaths. | | | Ages. | Number of Deaths. | | |
|---|---|---|---|---|---|---|---|
| | Males. | Fem. | M & F | | Males. | Fem. | M. & F. |
| 1 Month | 34,973 | 25,340 | 60,313 | 45 Years | 5,468 | 4,605 | 10,073 |
| 2 Months | 10,560 | 8,998 | 19,558 | 46 ,, | 3,444 | 2,812 | 6,256 |
| 3 ,, | 13,579 | 12,431 | 26,010 | 47 ,, | 2,387 | 1,688 | 4,075 |
| 4 ,, | 6,148 | 5 148 | 11,296 | 48 ,, | 3,661 | 3,026 | 6,687 |
| 5 ,, | 3,419 | 2,873 | 6,292 | 49 ,, | 1,745 | 1,305 | 3,050 |
| 6 ,, | 12,949 | 11,405 | 24,354 | 50 ,, | 17,771 | 15,952 | 33,723 |
| 7 ,, | 3,255 | 2,526 | 5,781 | 51 ,, | 1,731 | 1,392 | 3.123 |
| 8 ,, | 2,824 | 2,379 | 5,203 | 52 ,, | 4,160 | 2,918 | 7,078 |
| 9 ,, | 11,271 | 10,062 | 21,333 | 53 ,, | 2,173 | 1,572 | 3,745 |
| 10 ,, | 3,067 | 2,687 | 5,754 | 54 ,, | 3,388 | 2,589 | 5,977 |
| 11 ,, | 3,186 | 2,742 | 5,928 | 55 ,, | 6,166 | 5,061 | 11,227 |
| 12 ,, | 40,908 | 36,469 | 77,377 | 56 ,, | 5,023 | 4,244 | 9,267 |
| 2 Years | 37,648 | 36,036 | 73,684 | 57 ,, | 2,355 | 1,734 | 4,089 |
| 3 ,, | 21,181 | 21,596 | 42,777 | 58 ,, | 3,101 | 2,655 | 5,756 |
| 4 ,, | 13,936 | 14,268 | 28,204 | 59 ,, | 1,755 | 1,544 | 3,299 |
| 5 ,, | 10,564 | 10,689 | 21,253 | 60 ,, | 27,134 | 27,823 | 54,957 |
| 6 ,, | 7,528 | 7,519 | 15,047 | 61 ,, | 1,992 | 1,675 | 3,667 |
| 7 ,, | 7,654 | 7,490 | 15,144 | 62 ,, | 3,231 | 2,535 | 5,766 |
| 8 ,, | 5,192 | 5,224 | 10,416 | 63 ,, | 3,814 | 2,725 | 6,539 |
| 9 ,, | 4,765 | 4,832 | 9 597 | 64 ,, | 3,666 | 2,989 | 6,655 |
| 10 ,, | 4,000 | 4,068 | 8 068 | 65 ,, | 5,437 | 5,091 | 10,528 |
| 11 ,, | 3,201 | 3,330 | 6,531 | 66 ,, | 4,411 | 3,525 | 7,936 |
| 12 ,, | 3,422 | 3,617 | 7,039 | 67 ,, | 2,903 | 1,916 | 4,819 |
| 13 ,, | 2,787 | 3,172 | 5,959 | 68 ,, | 3,049 | 2,535 | 5,584 |
| 14 ,, | 3,511 | 3,775 | 7,286 | 69 ,, | 1,638 | 1,303 | 2,941 |
| 15 ,, | 3,265 | 3,913 | 7,178 | 70 ,, | 17,629 | 17,443 | 35,072 |
| 16 ,, | 3,679 | 4,584 | 8,263 | 71 ,, | 1,355 | 1,210 | 2,565 |
| 17 ,, | 4,182 | 4,422 | 8,604 | 72 ,, | 3,936 | 2,974 | 6,910 |
| 18 ,, | 5,515 | 5,473 | 10,988 | 73 ,, | 2,344 | 1,658 | 4,002 |
| 19 ,, | 5,022 | 4,214 | 9,236 | 74 ,, | 2,886 | 2,178 | 5,064 |
| 20 ,, | 6,141 | 6,034 | 12 175 | 75 ,, | 5,007 | 4,010 | 9,017 |
| 21 ,, | 5,513 | 3,846 | 9,359 | 76 ,, | 3,667 | 2,759 | 6,426 |
| 22 ,, | 6,272 | 4,665 | 10,937 | 77 ,, | 2,127 | 1,356 | 3,483 |
| 23 ,, | 4,607 | 3,557 | 8,164 | 78 ,, | 2,568 | 1,930 | 4,498 |
| 24 ,, | 5,441 | 4,477 | 9,918 | 79 ,, | 1,228 | 927 | 2,155 |
| 25 ,, | 5,601 | 5,003 | 10,604 | 80 ,, | 12,776 | 13,101 | 25,877 |
| 26 ,, | 5,065 | 4,715 | 9,780 | 81 ,, | 1,137 | 854 | 1,991 |
| 27 ,, | 4,178 | 3,616 | 7,794 | 82 ,, | 2,117 | 1,685 | 3,802 |
| 28 ,, | 4,969 | 4,794 | 9,763 | 83 ,, | 895 | 732 | 1,627 |
| 29 ,, | 2,582 | 2,151 | 4,733 | 84 ,, | 3,451 | 2,488 | 5,939 |
| 30 ,, | 9,126 | 11,340 | 20,466 | 85 ,, | 1,446 | 1,204 | 2,650 |
| 31 ,, | 1,836 | 1,637 | 3,473 | 86 ,, | 1,535 | 1,162 | 2,697 |
| 32 ,, | 3,689 | 3,824 | 7,513 | 87 ,, | 1,004 | 701 | 1,705 |
| 33 ,, | 2,706 | 2,456 | 5,162 | 88 ,, | 1,247 | 889 | 2,136 |
| 34 ,, | 3,223 | 3,192 | 6,415 | 89 ,, | 592 | 482 | 1,074 |
| 35 ,, | 5,023 | 5,334 | 10,357 | 90 ,, | 2,003 | 1,955 | 3,958 |
| 36 ,, | 4,357 | 4,581 | 8,638 | 92 ,, | 767 | 581 | 1,348 |
| 37 ,, | 2,423 | 2,045 | 4,468 | 94 ,, | 747 | 618 | 1,365 |
| 38 ,, | 3,217 | 3,296 | 6,513 | 96 ,, | 1,257 | 1,028 | 2,285 |
| 39 ,, | 1,656 | 1,601 | 3,257 | 98 ,, | 467 | 455 | 922 |
| 40 ,, | 14,811 | 15,678 | 30,489 | 100 ,, | 1,131 | 1,314 | 2,445 |
| 41 ,, | 1,877 | 1,522 | 3,399 | Ages not specified | 17,897 | 18,223 | 36,120 |
| 42 ,, | 3,376 | 2,721 | 6,097 | | | | |
| 43 ,, | 2,093 | 1,642 | 3,735 | | | | |
| 44 ,, | 3,073 | 2.369 | 5,442 | Tot. Deaths | 620,865 | 566,509 | 1,187,374 |

TABLE III.—" General Table of Deaths by Years and Ages," in the summary of Ireland, (page 183,) exhibits these returns in the civic and rural districts; but in both instances in 36,120 deaths, 17,897 males and 18,223 females, the ages were not specified, and, therefore, they are not taken into the account. From this we learn, that, out of 1,151,254 deaths where the ages were specified, occurring during a period of 10 years, 269,199 took place during the 1st year of life; 435,117 during the first five years; and one-half up to the 20th year, or between it and the 21st. This, therefore, as far as these records are worthy of credit, fixes the average age at which death took place, but varying in different localities, from 6 in Drogheda, and 6 to 7 in Galway, two of the most unhealthy towns in Ireland, to 31 in Wexford county, the rural district of which, it has been long a matter of history, is one of the most healthy. This average age at which death took place is arrived at by finding the mean period of a given number of deaths. For example, if in 11,480 deaths in the county of Carlow, it be found that one-half of the entire die under, or at the 29th year, then that becomes the average age, or mean point at which death took place—and not, as in other statistical returns, by summing the ages and dividing them by the number of deaths.

This average period of life, as expressed in the table of proportionate mortality, affords us a good criterion of the infantile mortality in particular localities, and is borne out by tabular arrangements constructed on the following principles.

Supposing our returns correct, the births of 1835 may be obtained by adding the deaths of the children who died in the year 1840, at 5 years old; those in 1839, at 4 years old; those in 1838, at 3; those in 1837, at 2; and those in 1836, at 1 year of age; and all the living children of 6 years old in 1841. By a similar process we obtain a knowledge of the births of the year 1836, 1837, 1838, 1839, and 1840; this gives us, as far as the records can be depended on, a series of facts relating to the number of dead and living children at the 1st, 2d, 3d, 4th, and 5th year of their existence, in any given place—then, by adding together all the living children *of a year old*, at all the periods from 1835 to 1840, from the population tables, we arrive at a number with which to compare the deaths of 1 year old during the same space of 5 years, from 1836 to 1840, both inclusive.

Through means of a similar nature we become possessed of the living and dead, at 2, 3, 4, and 5 years old, on which a ratio of mortality may be formed between the deaths and the living of like ages.

On this principle an infantile mortality may be arranged for the civic and rural districts of any county, city, or town, specified in the tables of deaths by means of Table III., " General Table of Deaths," and the tables of ages for the same localities in the population returns. It will, however, suffice to specify a few of those places wherein the least and greatest number of infantile deaths have occurred, as in the following table.

| DISTRICTS. | SEXES. | CARLOW COUNTY. | | | | | | DUBLIN COUNTY. | | | | | | KILDARE COUNTY. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Years of Existence. | | | | | Entire period. | Years of Existence. | | | | | Entire period. | Years of Existence. | | | | | Entire peiod |
| | | 1st. | 2d. | 3d. | 4th. | 5th. | | 1st. | 2d. | 3d. | 4th. | 5th. | | 1st. | 2d. | 3d. | 4th. | 5th. | |
| RURAL. | Males, 1 in | 11·11 | 33·78 | 76· | 93·2 | 463·5 | ... | 7·43 | 22·91 | 30·08 | 63·7 | 53·88 | ... | 11·09 | 32·19 | 45·13 | 88·15 | 138·3 | ... |
| | Females, „ | 12·7 | 32·61 | 52·37 | 29·45 | 144·3 | ... | 8·38 | 18·86 | 33·43 | 50·09 | 48· | ... | 11·01 | 34·37 | 60·33 | 78·23 | 130·6 | ... |
| | Males and Females, „ | 11·83 | 35·44 | 62·08 | 91·32 | 224·1 | ... | 7·87 | 20·71 | 81·62 | 56·24 | 50·88 | ... | 11·05 | 33·2 | 51·36 | 83·04 | 134·4 | ... |
| | Ratio per cent. | 8·44 | 2·82 | 1·61 | 1·09 | ·44 | 14·4 | 12·7 | 4·82 | 3·16 | 1·74 | 1·96 | 24·38 | 9·04 | 3·01 | 1·94 | 1·2 | ·74 | 15·93 |
| CIVIC. | Males, 1 in | 7·24 | 23·96 | 31·47 | 58·5 | 37·5 | ... | 6· | 12·31 | 24·86 | 27·7 | 55·4 | ... | 6·05 | 14·58 | 26·5 | 109· | 50· | ... |
| | Females, „ | 7·24 | 19·41 | 24·89 | 53·66 | 76·5 | ... | 6·61 | 18·18 | 23·23 | 41·57 | 48·16 | ... | 7·65 | 25·41 | 24·84 | 94· | 95· | ... |
| | Males and Females, „ | 7 24 | 21·58 | 28· | 56·08 | 50·5 | ... | 6·28 | 14·66 | 23·94 | 33·41 | 51·45 | ... | 6·73 | 18·41 | 25·64 | 101·5 | 65· | ... |
| | Ratio per cent. „ | 13·8 | 4·63 | 3·57 | 1·78 | 1·98 | 25·76 | 15·9 | 6·81 | 4·16 | 2·99 | 1·94 | [illegible] | 14·85 | 5·42 | 3·9 | ·98 | 1·53 | 26·68 |
| RURAL AND CIVIC | Males, 1 in | 10·2 | 35·27 | 61·98 | 85·19 | 179·5 | ... | 7·12 | 19·9 | 29·04 | 52·66 | 54·12 | ... | 10·42 | 29·62 | 43·04 | 89·36 | 123·5 | ... |
| | Females, „ | 11·33 | 29·65 | 45·12 | 81·19 | 127·3 | ... | 7·99 | 18·74 | 31·02 | 48·36 | 48·03 | ... | 10·64 | 33·5 | 54·49 | 79·11 | 127·3 | ... |
| | Males and Females, „ | 10·73 | 32·25 | 52·34 | 83·19 | 149·7 | ... | 7·52 | 19·31 | 29·97 | 50·44 | 50·98 | ... | 10·53 | 31·37 | 47·9 | 84·1 | 125·3 | ... |
| | Ratio per cent. | 9·31 | 3·1 | 1·91 | 1·2 | ·66 | 16·18 | 13·29 | 5·17 | 3·33 | 1·98 | 1·96 | 25·73 | 9·49 | 3·18 | 2·08 | 1·18 | ·79 | 16·72 |

| DISTRICT. | SEXES. | DROGHEDA TOWN. | | | | | | DUBLIN CITY. | | | | | | KILKENNY CITY. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Years of existence. | | | | | Entire period. | Years of Existence. | | | | | Entire period. | Years of Existence. | | | | | Entire period. |
| | | 1st. | 2d. | 3d. | 4th. | 5th. | | 1st. | 2d. | 3d. | 4 th. | 5th. | | 1st. | 2d. | 3d. | 4th. | 5th. | |
| CIVIC. | Males, 1 in | 5· | 12·28 | 19·9 | 22·81 | 31·5 | ... | 4·35 | 11·19 | 17·99 | 26·1 | 34·39 | ... | 5·1 | 18·1 | 23·07 | 71·16 | 49·5 | ... |
| | Females, „ | 6·32 | 18·55 | 18·32 | 23·17 | 91·5 | ... | 4·75 | 11·38 | 18·22 | 28·59 | 33·2 | ... | 5·4 | 20·1 | 17·52 | 60·71 | 35·5 | ... |
| | Males and Females, „ | 5·56 | 12·87 | 19·09 | 23· | 46·5 | ... | 4·54 | 11·29 | 18·1 | 27·3 | 33·78 | ... | 5·24 | 19·06 | 19·87 | 65·53 | 41·1 | ... |
| | Ratio per cent. | 17·97 | 7·76 | 5·23 | 4·34 | 2·15 | 37·45 | 22·01 | 8·85 | 5·52 | 3·66 | 2·95 | 42·99 | 19·04 | 5·24 | 5·03 | 1·52 | 2·43 | 33·23 |

Innumerable might be the tables and calculations formed from the general tables of deaths, by ages and by diseases, were they of sufficient accuracy to be made the ground-work of further refinement, or did the nature of this inquiry require it.

In concluding this portion of my report, I beg leave likewise to remark, that, in addition to those which I have already mentioned, two other deficiencies existed in the returns which you submitted to my inspection, and which tend to lessen the amount of deaths to a considerable extent. The first is, that, with very few exceptions, the still-born deaths were not returned. Now, taking those at 4 per cent., the lowest average which, I am induced to think, this country affords, we shall have lost at least 90,000 deaths during the ten years specified. Secondly, the instances in which the hospital records could afford no return of deaths, are so numerous, that from this cause alone several hundred deaths which, under an improved condition of the hospital registries, might have been returned, were necessarily omitted.

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## ART. II.—*On the Vision of Objects on and in the Eye.* By WILLIAM MACKENZIE, M. D., Surgeon Oculist in Scotland in Ordinary to Her Majesty the Queen, Fellow of the Royal College of Surgeons of England, Corresponding Member of the National Institute at Washington, &c. &c. &c.

### INTRODUCTION.

#### § 1. *Distinction of objective and subjective vision.*

A scholastic distinction, which, at first view, seems clear and well defined, has been drawn between *objective* and *subjective* vision. Under the former, it is meant to include those impressions of sight, which arise from objects external to the organ of vision; and under the latter, those sensations, or apparent sensations, which are independent of external objects. Light, emitted or reflected from any external body, passing through the pupil and humours of the eye, and striking the retina, will produce objective vision. Familiar examples of subjective vision occur as the result of pressure on the retina, either from without or from within the eye; of making the eye part of a galvanic circle; and of certain disordered states, either of the retina or of those portions of the nervous system with which the retina is continuous, and on which visual perception ultimately depends. Admitting, then, that there are grounds for the distinction of objective and subjective vision, under which head are we to place those phenomena, which appear when an observer looks at his own eye, (I do not mean in a mirror, but as if it were an external object placed before him,) inspects the surface of his own cornea, examines the state of his own vitreous humour, or contemplates the arrangement of the blood-vessels, which ramify on his own retina? Fortunate it is for us, that the objects on and in the eye are not generally seen in the exercise of normal vision, but either require some particular optical contrivance to bring them into view, become visible when the eye has lost its natural powers of adjustment, or impress the nerve of sight only in consequence of disease; for so very numerous are those objects, that, were they seen under ordinary circumstances, they would necessarily render vision exceedingly perplexed and obscure. Akin to some of the observations now referred to are certain imitations of visual sensation, which result from actual insensibility of some portion of the nervous apparatus of vision. The fact is, that objective vision merges into subjective, by degrees so insensible that it is scarcely possible to say where the one ends and the other begins.

## § 2. *Explanation of terms :—Muscæ volitantes, Spectra, Scotoma, Myodesopia.*

The vision of objects situated on the surface, or in the interior of the eye, has attracted attention, chiefly in relation to a symptom, to which the name of *muscæ volitantes** has been given. Any *spectrum*, or visual appearance, which is apt to impose on the patient, and lead him to think that flies are moving before him in the air, is called a *musca volitans ;* and that whether it results from an impression on the retina, produced by an object on or in the eye, or from a loss of sensibility in that membrane. Sir David Brewster† limits the term *musca* to the darkest portion of a certain variety of spectrum, but this is not the sense in which it is generally received. A dark spectrum is sometimes called a *scotoma*,‡ although not very correctly, as this term signifies properly the darkness which occasionally attends the feeling of vertigo. The seeing of muscæ volitantes has received from pathologists the name of *myodesopia*,§ a disease which has sometimes been defined‖ to be the seeing of objects not really present. The definition would be much more applicable to the generality of cases, were the word "not" omitted; for myodesopia, although in certain instances the result of a mere want of sensibility in the retina, arises oftener from the actual perception of objects on or in the eye. These two facts mark out the grand distinction of *myodesopia sensitiva* and *insensitiva*.

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* French—*Mouches volantes, Imaginations perpétuelles.* German—*Die Flecken vor den Augen.* Called by Galen sometimes *idola*, i. e. images or spectres; sometimes *phantasmata*, i. e. phantoms or apparitions. By later writers *imagines*, i. e. imitations.

† Transactions of the Royal Society of Edinburgh, Vol. xv. p. 380. Edinburgh, 1843.

‡ *Σκότωμα, vertigo*, from σκότος, *darkness.*

§ *Myodesopia, myodesopsia*, or *myiodesopsia*, from *μυῖα, a fly*, εἶδος *form*, and ὄψ *appearance* or *sight.* Latin—*Visus muscarum ; Visio phantasmatum.* German—*Das Flockensehen ; Das Mückensehen.*

‖ Even one of the most accurate and perspicuous of surgical writers has fallen into this absurdity. "Personen, die diesen Augenfehler (Myodesopsia, Crupsia, Photopsia) haben, sehen Gegenstände, die nicht wirklich da sind." Richter's Anfangsgründe der Wundarzneykunst, Vol. iii. p. 501. Göttingen, 1804.

### § 3. *Ancient notions regarding the cause of muscæ volitantes.*

The most ancient notions respecting the cause of muscæ volitantes were, that they arose from a turbid state of the humours of the eye, or from the presence of opaque corpuscles swimming in the aqueous humour. Hippocrates adopts the former of these suppositions, and compares the appearances in question to the figures of birds or of black lentils moving in the air;* while Galen, who adheres to the latter and more definite view, says, they seem as if so many gnats were flying about before the eyes.†

### § 4. *Pitcairn attempts to determine the cause of muscæ volitantes on mathematical principles.*

The positive manner in which Pitcairn, both in his inaugural Oration at Leyden, and in his tract, entitled *Theoria Morborum Oculi*,‡ asserted that no substance floating in the aqueous humour, or corpuscle inclosed within the eye, could form an image on the retina, and that therefore the common notions respecting muscæ volitantes, such as those above referred to, must be false, appear to have had considerable weight with succeeding authors.§

"Whoever," says he in his Oration, "will take into account the diameters of the humours of the eye, and the laws of refraction, will readily perceive that the images of objects in the eye would be projected behind the retina, and can therefore by no means affect vision.

"To make it evident, that corpuscles, in the aqueous or the vitreous humour, by intercepting the rays emitted by objects, can never produce the appearances of muscæ volitantes, we have only to refer to the optical principle, that there is no point of a visible object from which rays of light do not reach to every point of the cornea, and therefore, that although many points of the cornea may be covered, still all the parts of the object are seen by the eye.

"But if that point of the retina on which the rays emitted by some visible object ought to meet, be from any cause so covered or compressed as not to receive the image, then no sense of the object is excited; and if this happens to many points of the retina, the appearances called muscæ volitantes will be produced."

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* Hippocrates de Locis in Homine, § 7.

† Galenus de Symptomatum Causis, Lib. i. Cap. 2.

‡ Pitcairnii Opera, pp. 203, 206. Lugduni Batavorum, 1737.

§ The same opinion as that held by Pitcairn is ascribed by Morgagni to Des Chales, whose works I have not had an opportunity of consulting.

Pursuing the same subject in his *Theoria Morborum Oculi*, he thus expresses himself,—

"To those who understand the mathematical principles of vision, it is known, that, of parallel rays emerging from the aqueous humour into a glass sphere, the focus, after refraction at the convex surface of the sphere, is nine semidiameters of the sphere from the vertex of incidence; and of those same rays, on emergence from the sphere, that the focus is three semidiameters and a half from the sphere. Wherefore, parallel rays in the aqueous humour would, after refraction by an entire glass sphere, inclosed in the aqueous humour, converge to a point three semidiameters and a half of the sphere from the opposite side of the sphere; or, which is the same thing, the rays proceeding from a radiating point, placed three semidiameters and a half from a glass sphere, inclosed in the aqueous humour, would emerge parallel from the sphere, so that the image of this point being infinitely distant, could not be painted on the retina, and no vision of it therefore be produced.

"Optical observations being admitted, by which it is shown that the crystalline humour enjoys the same refractive power as glass, it is evident that no image can be pictured of any radiating body placed three semidiameters and a half from the crystalline. But the cornea of no eye is distant three semidiameters and a half of the crystalline from the crystalline. Therefore, there can be no vision of any body situated in the cornea, or in the aqueous humour, whether such body be fixed or free."

From these reasonings he draws the four following conclusions:—

1. That in cataract no figures of corpuscles can be observed by the patient, such as medical writers enumerate among the symptoms of that disease. But if along with an obscuration of sight, such spectra are perceived, amaurosis and cataract must be present together.

2. That if muscæ volitantes be perceived, no external ophthalmia being present, there must be amaurosis.

3. That, if along with external ophthalmia, muscæ volitantes are present, there must also be inflammation extending to the retina itself.

4. That in all cases such spectra arise from disease of the retina, parts of it being congested, compressed, or covered, so as to be incapable of receiving images.

Such being the views promulgated by Pitcairn, and implicitly received by Boerhaave, Plenck, Wardrop, and others, it may be satisfactory to see how far they are borne out by experiment.

### § 5. *Small bodies close to the eye rendered visible by excluding the lateral pencils of light.*

*Exp.* 1. Having closed one eye, and placed any small object, as a pin, at such a distance before the other eye as to see it most distinctly, if we gradually bring the object towards the eye, it becomes less and less distinct, and at last, when so close as to touch the eye-lashes, it disappears, the whole effect of its presence being to throw a shadow over the entire retina, and thus cause a mistiness in our perception of surrounding objects, so slight, however, as not even to prevent our reading a printed book held at the ordinary distance.

*Exp.* 2. If we now take a card, perforated with a pinhole, and bring it between the eye and the pin, we find that through the pinhole we see the pin distinctly.

Let A*b*, A*c*, A*d*, fig. 1, be rays proceeding from the point A, of the object, placed, as in these experiments, nearer the eye than the distance for distinct vision. The refractive powers of the eye would suffice to make those rays converge no nearer than to *y*, a point behind the eye, in tending to which point they would occupy on the retina a considerable circular space, and could therefore produce no distinct image of the point A. In like manner, the rays, B*b*, B*c*, B*d*, proceeding from B, would converge towards *x*, occupy on the retina a circular space partially overlapping that occupied by the rays proceeding from A, and produce no distinct image of the point B. This is the state of matters in the first experiment, in which the pin being brought closer and closer to the eye, at length disappears, in consequence of what is termed *distantial aberration*, the refractive powers of the cornea and humours being insufficient to bring the rays proceeding from an object placed so near to the eye, to focal points upon the retina.

By the intervention of the perforated card, in the second experiment, we interrupt the rays A*b*, A*d*, proceeding from the first point, and the rays B*b*, B*d*, proceeding from the second, reduce thus the circles of dissipation on the retina, so that they do not coincide, and allow a distinct image to be formed by means of the central rays, A*c*, B*c*, of each pencil.

The conclusion from the experiments is, that it is not the nearness of the object, but the large size of the pupil, or, in other words, the breadth of the luminous pencils, which, in ordinary circumstances, prevents small objects from forming an image on the retina, when brought close to the eye. The same cause, it is evident, will operate, to a certain extent, in preventing corpuscles, in or on the eye, from being seen, unless we limit the breadth of the luminous pencil which is admitted into the eye, by looking through a fine aperture. If we do so, it seems probable that any corpuscle on the surface or in the interior of the eye will be seen, exactly as the small body out of the eye is made perceptible by the same contrivance. We shall presently explain that this is really the case.

It is well known that a speck of the cornea, such as results from a deposition of lymph, and is called an *albugo*, or arises from the cicatrization of an ulcer, and is styled a *leucoma*, as it is incapable of causing a well-defined image on the retina, is never perceived, under ordinary circumstances, by the patient, but merely occasions, like the pin brought close to the eye in the first of the above experiments, a dimness over the whole retina, and consequently an indistinctness in the perception of all objects, proportionate to its breadth and density. The same holds true with respect to opacities immediately behind the pupil, such as central cataract, or a shred of opaque capsule remaining after an operation for cataract. Ann Thomson, aged 18, is at present under my care at the Glasgow Eye Infirmary, (No. 14133,) on account of *muscæ volitantes* which she sees with her right eye, in consequence of postfebrile ophthalmitis. The humours of this eye appear perfectly clear. On her left cornea she has a thin leucoma, and in the centre of the anterior capsule a small dense opacity, both of old standing; but with this eye she sees distinctly, and has no muscæ before it. Mr Ware mentions a case, "in which, after the removal of a cataract, a white opaque particle, about the size of the head of a small pin, moved continually upwards and downwards, near the centre of the pupil; but though very perceptible to observers, it was wholly unperceived by the patient, and neither interfered with vision, nor occasioned the smallest appearance of a *musca volitans*."* But, though opacities of the cornea and crystalline throw merely a shadow over the whole retina under ordinary circumstances, we only require to make the patient look through a pinhole, in order that he may see the figure of the spot. On doing so, he generally compares it to the wing of a fly, or to some similar object.

If we are to give assent to the doctrine of Pitcairn, it can only be with certain important limitations. We may admit it to be true, that the eye being of normal form, the pupil of a medium size, and no artificial means employed to limit the breadth of the luminous pencils admitted into the eye, no corpuscle, situated on or in the eye, and in front of its focal centre, can be seen by means of any image of it, formed by the refractive powers of the media of the eye alone, and thrown upon the retina.

Neither the mathematical principles of vision, referred to by Pitcairn, nor the experiments above noticed, determine the question, how far the retina will receive impressions from the shadow of bodies, placed behind the focal centre of the eye. "Corpora opaca postremas vitrei humoris cellulas inquinantia ab ægris non animadverti non posse," is the opinion of Morgagni,† an author than whom none who preceded him, and few who have followed him, have written so sagaciously on our present subject. Besides, it seems reasonable to believe, that both opaque and transparent bodies, situated on or in the eye, may sometimes be rendered objects of visual perception, by other means than simply by the rays of light, emitted or reflected by them, passing through the transparent media of the organ, and being thereby brought to foci upon the retina. It can scarcely admit of doubt, that the refractive powers of the bodies themselves may, in some instances, serve so to change the direction of the rays of light which pass through them, as to ensure the formation of images of those bodies on the retina, while, in other cases, the influence of those causes which give rise to that apparent property which the edges of bodies were once supposed to possess, and to which the name of *diffraction* or *inflection* of light was applied, may lead to the perception of minute filaments and corpuscles, situated in the interior of the eye, by means of the magnified and peculiarly constituted shadows which those causes produce.

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* Medico-Chirurgical Transactions, Vol. v. p. 265. London, 1814.

† Adversaria Anatomica Sexta, Animadversio 75, p. 95. Lugduni Batavorum, 1723.

### § 6. *Enumeration of the different kinds of spectra which give rise to myodesopia.*

I now proceed to consider the different kinds of spectra of which the eye is susceptible, and which, when they become exaggerated, give rise to the sensation of *muscæ volitantes*. This I shall do in the following order:—

I. Muco-lacrymal spectrum.

II. Spectra depending on corpuscles between the cornea and the vitreous body.

III. Spectra depending on corpuscles in or behind the vitreous body. Floating muscæ.

IV. Circulatory spectrum.

V. Vascular spectrum. Accidental colours. Retinal and choroidal muscæ. Fixed muscæ.

The first class includes an ectommatic spectrum; the other four classes are entommatic.*

## I. Muco-lacrymal spectrum.

### § 7. *Vision of the layer of mucus and tears on the surface of the cornea.*

In a number of the experiments, to which I shall have occasion hereafter to refer, it is necessary to ascertain whether the lenses, with which they are to be performed, be perfectly clean. This is ascertained by looking at the flame of a candle through the lens, and at the same time turning it on its axis. On doing so, any particles of dust adhering to the lens will revolve with it, and must be removed. If the lens is marked with scratches, this will be discovered in the same manner, and such a lens must be laid aside. This direction being understood once for all, it will be unnecessary to repeat it.

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* *Entommatic*, from ἐντος, *within*, and ὄμμα, *the eye*, is a convenient term invented by Nordmann. To get rid of two cumbrous circumlocutions, I have ventured to coin on the same model, *ectommatic* and *entohyaloid*.

*Exp.* 3. If a normal or a presbyopic eye be directed through a pretty deep concave lens, as one of 2½ inches' radius, or what is called No. 12, towards the flame of a candle, placed at the distance of about twenty feet, a circular luminous figure appears, dotted all over with minute round spots. These spots are images of the candle, multiplied by the layer of fluid lying on the surface of the cornea, and which consists of globules. The spots are seen to change their position with every act of nictitation. They are also seen to run together occasionally, so as to form larger spots, and then to separate, as we wink, into smaller ones. The fluid which gives rise to this appearance, is, of course, a mixture of tears with the mucous secretion of the conjunctiva. It lies upon the surface of the cornea in the form of minute drops, and no doubt exercises the function of preserving that surface in a moist and transparent state, fit for the easy transmission of the rays of light. Invisible in general to the naked eye, it is, in this simple experiment, rendered visible, by directing through it a small pencil of divergent light, each globule acting on the light which falls upon it, so as to converge it sufficiently, along with the refraction of the transparent media of the eye, to bring it to a focus on the retina.

*Exp.* 4. The fluid which bedews the cornea may be seen still more distinctly, by viewing a candle at twenty feet distance, or a street lamp at sixty feet distance, through a double-convex lens of 1½ inch focus, placed close before the eye. Every act of nictitation is seen to push the fluid down to the lower lid, and instantly as the eye is opened a number of the globules of which it consists spring up again towards the upper lid. They seem large, opaque, and their edges iridescent.

*Exp.* 5. In the last experiment, the upper eyelid and the globules on the cornea are seen in their natural place. To see them inverted, we require only to carry the lens forward from the eye, so that the cornea is no longer within the focal distance of the lens. On closing the eye, the upper eyelid is now seen as if rising from the lower part of the field of view, and the globules, after each act of nictitation, appear as if they floated downwards over the cornea. The same objects are also inverted in Exp. 3.

### § 8. *Muco-lacrymal spectrum seen in the field of the microscope and telescope.*

In hanging the head over the microscope, especially if one is affected at the time with catarrh, the globules seen in the last three experiments, by gravitating to the centre of the cornea, not unfrequently appear to the observer, so as to impede his view of the object, till by another act of nictitation he clears them away.

In telescopic observations, also, the muco-lacrymal spectrum is apt to prove a source of annoyance. Thus, in looking at the sun through a tinted glass, the observer may be unable to distinguish the spots on that body, being perplexed by what seems the reflexion of some part of his own eye, interposed between it and the sun. This is caused by the layer of mucus and tears on the surface of the cornea.

### § 9. *Muco-lacrymal muscæ volitantes.*

I have been consulted by a very short-sighted person, who is occasionally troubled with the appearance of numerous opaque round spots before one of his eyes, each spot being surrounded by a halo. Sometimes several of them appear to run together into dots, which again divide and disappear. He notices that they ascend after every act of nictitation. From his description, and the figure which he sent me, of this peculiar variety of *muscæ volitantes*, I had no doubt that what he saw was merely the globules of the muco-lacrymal fluid on the surface of the cornea. It is perhaps to this sort of *muscæ volitantes* that Morgagni refers, when he says, "At spectra illa non modo oculis immotis, moventur, sed assiduè (ad palpebrarum præsertim motum, lacrymalem illum impurum laticem dimoventium) variantur, evanescunt, redeunt." At the same time, *muscæ volitantes* depending on the muco-lacrymal fluid are very rarely the subject of complaint.

## II. SPECTRA DEPENDING ON CORPUSCLES BETWEEN THE CORNEA AND THE VITREOUS HUMOUR.

### § 10. *Want of accurate observations of such spectra.*

I shall by and bye consider the opinions of Donné and Prevost, who place the cause of the most common kind of *muscæ volitantes*, the former in the aqueous humour, and the latter in the humour of Morgagni. I am not prepared to deny the possibility of spectra being discovered by optical contrivances, depending on the presence of corpuscles between the cornea and the vitreous humour, although my present conviction is, that no accurate observations have been made of any such spectra. Corpuscles in the aqueous or the crystalline humour will not be visible, under ordinary circumstances, to the person in whose eye they exist, and will have little, if any, effect on the distinctness of vision. They may perhaps be visible to an eye exceedingly myopic, and, to the scientific observer, may sometimes prove a still more serious evil than the globules on the cornea, as their shadow, perceptible on looking through a microscope or telescope of high power, cannot be got quit of, like the muco-lacrymal spectrum, by mere nictitation.

§ 11. *Methods of detecting and distinguishing such spectra.* The methods of detecting the presence of corpuscles in the aqueous or the crystalline humour will resemble those already indicated in *Exps.* 3, 4, and 5, or those which I shall presently describe for the discovery of spectra depending on causes residing behind the crystalline. They will be distinguished from the globules which rest on the cornea, by their occupying a posterior plane in the field of view; by the double images, formed of them on exposing the eye to two divergent beams of light, being less separated from one another than the double images of the muco-lacrymal spectrum, and by their not suffering the same changes from the act of nictitation. From corpuscles residing in the vitreous humour, they will be distinguished by their occupying an anterior plane in the field of view, by their double images being more widely separated, and by the possibility of readily inverting their spectrum, by the same means by which we invert that of the globules on the cornea, as in *Exp.* 5.

This last circumstance has been fixed on by Captain Kater,* as affording a ready means of discriminating between spectra depending on causes residing in the cornea, aqueous humour, or crystalline, and those depending on causes residing in the vitreous humour. The rules, however, which he gives for the use of this test, although perfectly correct, are delivered in a style rather enigmatical, and therefore apt to puzzle those not perfectly acquainted with the subject. The simplest view of the matter seems to be this:—If, as in *Exps.* 4 and 5, by shifting the focus of the rays which impinge on the retina, we find that the corpuscles, the situation of which is the object of investigation, are at one time, as in *Exp.* 4, anterior, and at another time, as in *Exp.* 5, posterior to that focus, and their spectrum thereby inverted, this proves that they are situated in the anterior part of the eye, whereas if we cannot thus invert the spectrum, the cause must reside in the vitreous humour.†

## III. SPECTRA DEPENDING ON CORPUSCLES IN OR BEHIND THE VITREOUS BODY. FLOATING MUSCÆ.

§ 12. *Four different spectra of this class. Methods of viewing them. Relative positions of the corpuscles which produce them. Their limited mobility.*

*Exp.* 6. Through the eye-glass of a compound microscope, look at the flame of a candle, two or three feet distant. On steadily regarding the luminous field presented to view, four sets of spectra will be seen, independent of the muco-lacrymal spectrum. The most remarkable appears nearest to the eye, and consists of twisted strings of minute pearly globules hung across the field of view. The second in point of remarkableness, and the farthest from the eye, consists of watery-like threads, destitute of any globular appearance, and depending chiefly from the upper part of the field. I shall call the former the *pearly spectrum*, and the latter the *watery*. In two distinct planes, between those occupied by these two spectra, are placed two sets of globules, not aggregated into threads, but insulated. These constitute what I shall call the *insulo-globular spectra*. The set farther from the eye is hazy and ill defined, and may be compared to small grains of sago. The set nearer to the eye are clear in the centre, exterior to which they present a sharp black ring, and still more exteriorly a lucid circumference. These four sets of spectra never mingle with one another, so as to change the order in which they stand before the eye; but the pearly spectrum always appears the nearest, then the sharply defined insulo-globular, then the obscurely defined globules, and farthest away the watery threads. Fig. 2.

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* Remarks on certain Spots discoverable in the Human Eye, at the end of Guthrie on Extraction of a Cataract. London, 1834.

† It would be desirable that the above rule were more definite. On theoretical principles, it seems possible to invert the image of any corpuscle, however deep in the eye it may be situated; but I have never succeeded except with the muco-lacrymal spectrum.

Donné* has described the pearly and the two insulo-globular spectra, as seen through a pinhole in a card. The watery spectrum had escaped his observation.

That the corpuscles which produce these four sets of spectra are situated in or behind the vitreous humour, and not, as Donné supposed with regard to those of them which he saw, in the aqueous, is manifest from the fact, that none of these spectra can be inverted, by viewing them through a concave lens, or by first viewing them through a convex lens held close to the eye, and then carrying the lens forwards from the eye, so that the eye is without the focal distance of the lens, experiments which at once invert the muco-lacrymal spectrum, and would, it is presumed, do the same to any spectrum depending on the state of the aqueous humour or the crystalline.

That the spectra stand in the order which I have assigned to them, will appear distinctly, perhaps not at the very first glance, but certainly on conducting the examination with a little pains, either through the eye-glass of the compound microscope, or through a hole made in a card with a fine needle, the eye being directed towards the sky, or towards a lighted candle.†

Various other methods of viewing the spectra in question might be mentioned. The following is the readiest of all.

*Exp.* 7. If, bringing the eyelids towards each other, we look at a lighted candle, the spectra now described appear very distinctly over the flame, and in the two vertical beams of light which are produced by the action of the edges of the eyelids upon the light of the candle.* If we bend the head to one side, the beams assume a horizontal direction, and, at the same time, the linear spectra which appeared, in the former position of the head, in a vertical direction, will now be seen in a horizontal one, and *vice versa*, showing that their cause is not loose within any of the fluids of the eye, nor swimming on its surface, in either of which cases they would, on the position of the head being changed, immediately assume the same direction as that in which they were at first seen.

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* Archives Générales de Médecine, Tom. xxiii. p. 115. Paris, 1830.

† These methods of examining spectra appear to have been first pointed out in the Histoire de l'Académie Royale des Sciences pour 1760, p. 57. Paris, 1766.

### § 13. *Method of procuring double images of corpuscles situated in front of the retina.*

The following beautiful experiment, by which we procure double images of every object on the eye, or within it and in front of the retina, we owe to Sir David Brewster, who has by its means thrown more light on the subject of *muscæ volitantes* than all preceding writers.

*Exp.* 8. Place two candles before the eye, at the distance of a few inches from each other. Look at them through a pin-hole or through a double-convex lens, so as to make the two luminous fields to overlap. In the middle space, formed by the overlapping of the two fields, double images will be seen of all the perceptible objects on the eye, or within it and in front of the retina, and amongst these, double images of the muco-lacrymal globules, the watery spectrum, the insulo-globular spectra, and the pearly spectrum. If the candles are placed about ten feet from the eye, and viewed through a lens of one and a half inch focus, the double images of the muco-lacrymal globules will be seen to be widely apart from one another, the double images of the threads of the watery spectrum less widely, less widely still those of the obscure insulo-globular spectrum and of the sharply defined one, while the double images of the pearly spectrum are quite close to one another, showing the relative position of the causes of these spectra in the eye; viz. the muco-lacrymal substance on the surface of the cornea, and the corpuscles causing the pearly spectrum close to the retina, while the causes of the watery and insulo-globular spectra occupy the middle space.

### § 14. *Appearances of the watery spectrum.*

The depending threads of which the watery spectrum consists have somewhat of a rounded appearance, differing in this respect from the pearly *muscæ volitantes*, the threads of which seem flat. Each of the watery threads is bounded by two dark lines, within which there is a broad space, which is clear, and entirely destitute of anything like globules. These watery threads measure fully twice the diameter of the threads of the pearly spectrum. Their number is generally about six or eight. They are not all situated in one plane. Their general course is vertical, and gently flexuous. They often divide at their lower extremity into two or more branches, which seem to melt away insensibly. They have so much the appearance which we might suppose streams of tears to have, as they descend from the lacrymal ducts and flow over the cornea, that I at one time thought that this was their real nature, till I discovered that they exist in a plane or planes posterior to the muco-lacrymal spectrum. At first view, they seem to slide down slowly from the upper to the middle part of the field of view, but they possess neither the extent nor the quickness of motion of the pearly spectrum. They are rarely seen at the lower part of the field of view. Any bending or extending which they undergo in the movements of the eye are slight, and their seeming to be displaced and broken into fragments by nictitation is a deception.

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* The production of these beams of light by the edges of the eyelids has been referred to refraction by some authors, and by others to inflection. The upper beam is the effect of the lower lid, and *vice versa*.—See Harris's Treatise of Optics, p. 137. London, 1775.

I have called this spectrum the *watery*, merely from its appearance, for I have ascertained neither its exact seat nor its nature. It seems probable, that the cause upon which it depends is not far behind the crystalline, and that this cause may be connected with the obliterated capsular vessels, is a natural enough conjecture, although, perhaps, not to be much depended upon.

### § 15. *Sensation of muscæ volitantes produced by the watery spectrum.*

The watery spectrum becomes, in some cases, so much exaggerated, as to give rise to the sensation of *muscæ volitantes*. It is most apt to be perceived by the naked eye, on first going out in the morning. It is compared, by some patients, to the appearance of threads of spun glass, laid across each other, or to that of a fine lock of wool. It appears a little above the centre of the field of vision, and, of course, seems greatly magnified by the distance of the surface against which it is viewed. Although it still retains the form of numerous watery threads, and these never appearing to contain globules, the threads are more irregularly heaped together, and often assume a zigzag figure. They are also either readily dispersed by one or two forcible acts of nictitation, (differing in this respect from the spectrum, as viewed through a pinhole or the eye-glass of a compound microscope,) or by such acts the eye falls into a state in which they are no longer perceptible. The circumstances now noticed are very apt to mislead the patient as to the seat of what he sees, which he probably refers to the surface, and not to the interior of his eye, where the cause actually resides.

### § 16. *Muscæ volitantes produced by the insulo-globular spectra.*

The ill-defined globules, which lie immediately behind the watery spectrum, rarely give rise to the sensation of *muscæ volitantes*; but the globules which occupy the next plane, and whose edges are sharp and dark, frequently appear to the naked eye, either as simple black points, or as black rings. Viewed carelessly, or without the aid of any optical contrivance, they generally seem to be connected to the outside of the threads constituting the pearly *muscæ volitantes.*

### § 17. *Appearances of the pearly spectrum.*

Almost every eye, even the most healthy, and which has never attracted the possessor's attention by *muscæ volitantes*, exhibits the pearly spectrum, on being directed, as in *Exp.* 6, towards a luminous field, through a fine pinhole, the eye-glass of a compound microscope, or a convex or concave lens of short focus. I give it the name of the *pearly spectrum*, from its resemblance to a string of pearls. Prevost[*] has already called it *apparence perlée*, or simply *perles.*

The lines of the pearly spectrum are hung across the field of vision as often transversely as vertically. On first directing the eye towards the luminous field, in one or other of the methods just mentioned, perhaps only a very few small pearly globules are perceived; but after steadily regarding it for some time, numerous strings of them are discovered, generally twisted in different forms, often placed side by side with one another, and presenting a variety of knots, loops, and agglomerations. Sometimes they are so numerous as to form an extensive shower or cloud. The pearly threads are of different lengths, some of them very short, others stretching across the whole field. Not unfrequently some of them end abruptly in a sort of bulb. The globules or pearls, forming the threads or rosaries, seem joined together merely by apposition, without being contained in any tube. Sometimes, however, the globules are rather indistinct, and then the threads approach to a tubular appearance. The globules or pearls are always in single rows. They appear to be destitute of any nucleus. They are not all of one diameter, but are all smaller than the globules of the insulo-globular spectra. I have not satisfied myself that they all occupy the same plane, although it is very evident that they are behind the insulo-globular spectra.

### § 18. *Apparent and real motions of the pearly spectrum.*

That portion of the pearly spectrum, which appears in the centre of the field of view, has but little real motion; less perhaps than the watery spectrum, which is seen beyond it. Both partake, of course, in the motion of the eye-ball, and this gives to both a wide apparent motion. But if the field be examined towards its circumference, or if the eye be suddenly rotated upwards, other pearly spectra appear, which it is difficult or impossible for the observer to bring directly before him, and which, when he succeeds in some measure in doing so, quickly subside again out of view, partly by a real motion of their own, partly by a wide apparent motion, owing to their obliquity in respect to the axis of vision. It is these last spectra chiefly, which produce the pearly *muscæ volitantes*.

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[*] Mémoires de la Société de Physique et d'Histoire Naturelle de Genève, Tom. v. p. 244. Genève, 1832.

### § 19. *Appearances of the pearly muscæ volitantes.*

Those who begin to be troubled with by far the most common kind of *muscæ volitantes*, find their attention attracted by the appearance of one or more blackish particles dancing before them in the air, and leading them to suppose that perhaps a bit of soot is sticking to their eyelashes, or a minute spider suspending itself from the brim of the hat. On trying to brush away the supposed object, they find out the mistake, and that the spectrum which they see depends on something more immediately affecting the organ of vision than they at first imagined.

In other cases the earliest appearance is that of a thin cloud, somewhat like the wing of a fly, or that of semi-opaque threads, like spider's web.

On directing the eyes from side to side, the spectrum moves also, and with such seeming swiftness as often to lead the patient to suppose that a gnat or small fly is crossing the field of vision. Hence the name *muscæ volitantes*.

In this state the patient often continues for months or years, without taking the trouble of examining the appearances with any considerable degree of attention. Sometimes, indeed, the annular figure of the darkest portions of the muscæ is too striking to escape notice, and patients often designate such by the name of *black stars*. If the patient takes the trouble of turning his eyes steadily to the clear sky for a minute or two, he often finds what had hitherto appeared like a thin cloud, bit of cobweb, or the wing of an insect, to resolve itself into a great number of globules, or minute rings, moving as the eye moves, and connected together as if by some invisible film, so that, although they may change in some measure their relative positions, they never separate entirely from one another.

A still more careful examination of his muscæ volitantes against the clear expanse of the sky, or against the ground covered with snow, probably discloses to the patient a twisted tubular appearance, the tube being bounded by two opaque lines, while the central space is occupied by a chain of obscure spots or globules, not sufficiently large in general to fill the diameter of the tube, so that the patient, while he compares the whole spectrum to a twisted snake, tells us perhaps that the inside of it resembles the withered substance within the stalk of a quill. The globules, however, are not all of one size, for here and there one larger and more distinctly nucleated than the rest appears, and fills the tube's diameter, while not unfrequently one or two of the rings of the insulo-globular spectrum is seen as if attached to the outside of the tube, as is represented in Fig. 3. The observer also remarks, in some cases, that the tubes seem to end in dark bulbous extremities, as if formed by agglomerations of globules. The dark spots, or black stars, which he first saw when he began to be troubled with such sensations, he finds to be caused either by such agglomerations, or by an appearance at certain points as if the tubes were coiled up or doubled upon themselves. Such dark spots are often so dense, that in a good light they are visible even through the closed eye-lids.

If the patient views his muscæ volitantes, in the manner pointed out in *Exp.* 6, the appearance of a tube, containing globules, is by no means so striking as when he views them with the naked eye against the sky, so that he sees merely rosaries and showers of globules, and these destitute of nuclei. The appearance of a tube is produced in fact by those portions of the rings or globules which touch each other becoming obscure, while the portions by which they do no not touch continue more or less distinct. Hence the edges of the tubes are not straight lines, but undulated.

Pearly muscæ appear chiefly when the patient looks at the clear sky, a thin light cloud, the ground covered with snow, a white wall, and the like. By candle light he seldom notices them, nor do they appear when he regards a dark object, or is in a place where there is but little light. He seldom remarks them when he looks at near objects, or when he keeps his eyes still.

### § 20. *Position of the pearly muscæ volitantes. Their apparent motions.*

The pearly muscæ volitantes are rarely in the axis of vision, but generally a considerable number of degrees from it, outwards or inwards, upwards or downwards. The consequence is, that the patient finds it difficult, in proportion to the obliquity of their position, to examine their configuration and apparent structure; for whenever he tries to bring them directly before him, they flit away, so that he sees them only by a side glance. They partake also in the motions of the eye, darting upwards or downwards, or from side to side, as the eye is moved, and justifying by their apparent movements the comparison indicated by the name of *muscæ volitantes.*

### § 21. *Real motions of the pearly muscæ volitantes.*

If a musca volitans is in or near the axis of vision, it is easy for the patient to keep it fixed for a length of time, over any particular spot in the prospect before him, or in the centre of the luminous field presented by a candle, viewed through a convex or concave lens. The pearly muscæ volitantes, however, have a motion of their own, excited no doubt by the motions of the eye-ball, but still more extensive than their apparent motions, and partly exhibited after the eye-ball is at rest. Thus, if, from looking before him in a horizontal direction, the patient suddenly raises his eyes towards a point about 30° above the horizon, and fixes them on some object at that height, he observes that the muscæ fly upwards considerably beyond that degree of elevation, and even beyond the field of view, and then come sailing down before him till they disappear below, evidently showing that whatever be the nature and seat of the corpuscles by which such spectra are produced, they are not fixed, but enjoy a certain degree of freedom.

Muscæ volitantes are described by some authors* as suddenly darting upwards, and then as suddenly sinking; but they never do this, unless first set in motion by the movement of the eye-ball; and although the motion which they perform in consequence of the impetus given them by the movement of the eye-ball is rapid, that by which they return to their former place is comparatively slow.

Were the corpuscles, which produce the pearly muscæ volitantes, situated anterior to the focal centre of the eye, then their real motion would correspond with the apparent motion of the spectrum or muscæ; that is to say, they would descend within the eye, when the muscæ appeared to descend; but if the corpuscles be situated behind the focal centre, the apparent descent of the muscæ must depend on an actual ascent of the corpuscles. Wherever a corpuscle is situated, whether at *a* or at *a'*, (Fig. 4,) its spectrum will appear as if projected out of the eye in the continued course of a straight line, passing through the corpuscle, and falling nearly perpendicularly on the retina at A. A corpuscle at *b*, anterior to the focal centre of the eye, or at *b'*, posterior to that centre, will form its image at B, and produce the sensation of a spectrum out of the eye, in the direction of the line B*b'b*. If the corpuscle is situated at *a*, and sinks in the eye to *b*, then its image will move over the retina from A to B, and its spectrum will appear to the patient to descend from A' to B'. But if the corpuscle is situated at *a'*, it will only be by floating upwards from *a'* to *b'* in the vitreous humour that its image will move over the retina from A to B, and its spectrum appear to the patient to descend from A' to B'.

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* Beer, Lehre von den Augenkrankheiten, vol. ii. p. 424. Wien, 1817.

If the cause, then, of the pearly muscæ, which always appear to descend when the eye is fixed on any elevated object, resided in the aqueous humour, this apparent descent of the muscæ would depend on a real descent of the corpuscles by which they are produced; but if the cause resides in the vitreous humour, the apparent descent of the muscæ must depend on a real ascent of the corpuscles.

Besides the motions of ascent and descent, the pearly muscæ present lateral movements, although less marked, as well as changes in the relative positions of their several parts. If three or four *black stars*, as they are termed, exist in the mesh-like texture which floats before the eye, they will perhaps be observed to lie sometimes in a straight line, and at other times to form an angle with one another, being thrown into different positions in the various movements of the eye. The upper part of the tube-like spectrum will sometimes seem to bend in one direction, and the lower part in the opposite. The tubes will appear to uncoil themselves, and then twist themselves into their former shape. A vacillating motion is sometimes observed, as if the web waved backward and forward. All these movements are excited by the motion of the eye-ball; but it is easily observed that their extent is greater than that of the motion of the eye-ball, and that the latter serves merely to set the motions of the muscæ agoing.

### § 22. *Seat of the efficient cause of the pearly muscæ volitantes.*

Many conjectures have been offered regarding the seat of the corpuscles or filaments, which give rise to the pearly *muscæ volitantes.* The surface of the cornea, the aqueous humour, the humour of Morgagni, the vitreous humour, the space between the hyaloid membrane and the retina, the retina, and the choroid, have each been supposed to be occupied by the efficient cause of this symptom. That the pearly muscæ do not arise from corpuscles, situated on the cornea, in the aqueous humour, or in the humour of Morgagni, is evident, from their existing in a plane far behind the corpuscles which produce the muco-lacrymal and watery spectra, from their never mingling with these spectra, from their not being inverted in the experiment which inverts the muco-lacrymal spectrum, and from the closeness of their double images to one another when viewed by means of two divergent beams of light. The fact that double images of the pearly spectrum are always produced in this mode of examining them, shows that their cause does not reside in the nervous substance of the retina, or in the choroid. So decisive are the proofs afforded by the simple facts now referred to, that I might almost be excused from entering on a critical review of opinions so palpably false, as some of those I shall now shortly notice.

1. *Cornea.*—Ribes,[*] Vest,[†] Wigan,[‡] and Stark,[§] have maintained, at considerable length, that *muscæ volitantes*, (and it is evident that under this term they include the pearly,) depend on the tears resting on the cornea, and moving over its surface.

Ribes evidently confounds the muco-lacrymal with the pearly spectrum. He says, indeed, that he saw several layers of globules, sliding apparently over one another; but he has overlooked the important fact, that the most remote of these layers is displaced by the act of nictitation, while the nearest remains totally unaffected, and erroneously attributes the whole to the tears.

Vest examines the entohyaloid muscæ as in Exp. 7; but omitting to observe, that they exist in several planes, posterior to that of the muco-lacrymal spectrum, he refers them to the fluids resting on the surface of the cornea.

Mr Wigan seems to have observed only the pearly muscæ, but to have deceived himself, as to their being dispersed into fresh forms by nictitation.

Dr Stark saw both muco-lacrymal and pearly spectra; but the fact that they are in different planes escaped him, and he states that the globules never rolled over each other.

He thinks the particles of the pearly muscæ are only accidentally agglutinated, as moving the eye seemed to him to have the effect of destroying completely their old arrangement, and of throwing them into new, but still linear forms. If the particles were only accidentally agglutinated, how could it happen that for a long series of years they should chance day after day to reassume the same identical order, so as to produce spectra, the form, size, and extent of which remain unaltered? True it is, a toss of the head will throw them for a little while into somewhat of a different figure, will perhaps make the knots, or darker spots, of the lines or rosaries, the *real muscæ* of Sir David Brewster, the *black stars* of the vulgar, to approach each other, or the lines to twist or to uncoil themselves; but these changes are merely transient, as generally in a few minutes the knots and lines reassume their former disposition, and appear exactly as they have done day after day for many successive years. This is totally irreconcilable to the supposition that the lines consist of particles accidentally connected together, either on the surface of the cornea or any where else.

Neither is there any breaking off of any of the particles of the pearly muscæ. This only *seems* to be the case, from some part of the tube or filament becoming, for a time, less distinctly, or not at all, visible. In a few minutes the rings or globules again appear in continuity, and the rosary is seen exactly as it was before, and as it has been seen perhaps for twenty years. Although the muscæ appear to separate and break, some invisible connection still holds them together, and serves to bring them again before the eye in their old shape.

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[*] Archives Générales de Médecine, Tome xxii. p. 445. Paris, 1830.

[†] Abhandlung über das Mückensehen, von J. B. Ritter v. Felsach, p. 10. Wien, 1833.

[‡] London Medical Gazette, Vol. xxvii. p. 719. London, 1841.

[§] Edinburgh Medical and Surgical Journal. Vol. lx. p. 399. Edinburgh, 1843.

"Sometimes," says Dr Stark, describing his observations, "two lines would unite where they came into contact, form a thicker line, and, if the situation of the line were somewhat vertical, form a kind of ball or globe at its lower point, evidently at the expense of the line above, would drop off, and more rapidly fall beyond the field of vision."* Now, pearly muscæ never unite in this way. Their filaments have often a bulb at their extremities; but it is a permanent thing; the observer never sees it form.

The greater part of Dr Stark's account of the rate of motion of the muscæ, probably applies to the tears or mucous globules, but there can be no doubt, I think, that in his description he has confounded these with the pearly muscæ. What he says about "the muscæ never crossing each other's edges, so as to be visible in all their circumference during the whole time," cannot apply to the spectra depending on corpuscles in the vitreous humour. Every one may see different layers of these spectra, independent altogether of anything on the surface of the cornea. The pearly, the insulo-globular, and the watery spectra are seen, the one set behind the other; while still farther from the eye appears the muco-lacrymal spectrum. All these cross each other, as the eye is moved from side to side, the one set eclipsing for the time those who are more remote from the retina. Dr Stark's statement shows, that though he saw pearly muscæ as well as muco-lacrymal ones, he did not observe them with accuracy.

If Dr Stark's description could be received as correct, and not defective in any material point, we should admit his conclusion, "that the only place of the eye which could permit of the occurrence of phenomena such as those described must be on the conjunctival surface of the transparent cornea." But the fact, that the bodies causing the sensation of *muscæ volitantes* are seen in at least five different planes, sets aside this conclusion entirely.

Dr Stark tells us, that "the eye looking through a fine aperture in a plate of metal, or through a minute lens, was directed to the bright wall or a clear portion of the sky. It was then kept fixed steadily in one position, till the greater part of the muscæ had descended below the middle of the axis of vision. The ball of the eye being still kept steadily fixed, the upper eyelid was brought slowly down till the obscuration by a dark body fringed with eyelashes, and making its descent, arrived over the uppermost of the descending muscæ. The moment this was done, the body was arrested in its downward progress, and when the eyelid was allowed to elevate itself, those muscæ which it had covered were raised with it, and immediately thereafter began to redescend slowly as before."[*]

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* Ib. p. 404.

In this observation Dr Stark has completely deceived himself; for if we look through a pinhole or minute lens, as he describes, and bring the upper eyelid down over the eye, the obscuration appears below, agreeably to the first of the laws of light, viz. that from every luminous point light radiates in straight lines. The experiment which shows this to be true is exceedingly simple.

*Exp.* 9. Let a pinhole in a card be brought in front of the eye directed towards a luminous field, and let any opaque body, such as a paper-folder, be brought in slowly between the eye and the hole in the card. When this is done, it will be observed, that the opposite side of the field to that on which the opaque body is brought in becomes eclipsed; the left side, for instance, if the paper-folder is brought in from the right, and *vice versa.* If the upper eyelid be the opaque body, it will be observed that as it descends, the lower part of the field becomes darkened, the shadow of the eyelid appearing to rise from below.

To excite inquiry in those commencing to study optics, the experiment is often made in the following manner.

*Exp.* 10. The eye being directed through a pinhole towards any luminous field, such as that furnished by a lighted candle, a common pin, with its head uppermost, is brought up from below, between the eye and the pinhole. When this is done, the pin appears as if it were on the other side of the card, dark and inverted. In this experiment, the shadow of the pin on the eye is projected on the retina, and so far as the flame of the candle is concerned, the pin intercepts the light proceeding from above, through the pinhole, exactly as if it were placed beyond the pinhole, with its head downwards. Hence the inverted appearance of the pin.

Let AB, Fig. 5, be the candle, and AC, AD, the cone of rays, which, proceeding from A, can pass through the pinhole, H, and BE, BF, the cone proceeding from B. As the one cone must cross the other, if the pin, P, be brought with its head uppermost, between the eye and the pinhole, it will prevent the cone of light proceeding from A, from reaching the eye, exactly as if it were introduced with its head down at P′, beyond the pinhole. The shadow of the pin at P is projected on the retina, and produces the same impression as if it were in an inverted position at P′.

So also will the edge of the upper eyelid appear inverted in the experiment described by Dr Stark, and no such thing as a *dark body making its descent, till it arrives at the uppermost of the muscæ, will be seen.*

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[*] Ib. p. 406.

When Prevost, in the Society of Natural Philosophy and Natural History of Geneva, urged the permanency of the forms of the pearly rosaries, which he had seen for a long series of years, as incompatible with a cause so changeable as the tears, one of the members proposed to explain the constancy, by certain tracks or furrows, which he presumed might exist on the surface of the cornea. This notion will appear quite untenable to any one who has in his own eye watched the ascent and descent of the pearly muscæ, when the eye is suddenly turned upwards, and then fixed upon some elevated object. These motions depend upon a real change of place in the corpuscles which produce the pearly muscæ, but one of a very different character from the confined movement of a fluid in a track or furrow.

2. *Aqueous humour.*—The aqueous humour has been regarded as the seat of the efficient cause of *muscæ volitantes*, some supposing the cause to be opaque and others transparent, some supposing it to be free and others partially attached.

The motions of the pearly muscæ, on suddenly raising the eye and fixing it on some elevated object, are totally irreconcileable to the idea of the cause being free to move in every direction in a fluid; for although by no means so confined as they would be, were their cause a fluid moving in a furrow, they are still limited, both in extent and in direction. Neither do the corpuscles which produce the pearly spectrum move as if they settled from their gravity at the bottom of the cavity wherein they are contained, or swam to the top of it from lightness, as they might do, if in the aqueous humour. These objections apply as well to transparent as to opaque corpuscles.

Donné[*] has detected microscopic corpuscles in the aqueous humour in large quantity. They are one half less than those of the blood, and are perfectly transparent. He supposes them to be the cause of the pearly and insulo-globular spectra. The rosaries, however, of globules, which constitute the pearly spectrum, are too constant in their figure to be the result of any accidental accumulation of particles, floating freely through a fluid. Even the insulo-globular spectra are evidently owing to globules which are adherent to some moveable film.

The notion of De la Hire[†] is perhaps somewhat less improbable than that of Donné, namely, that *muscæ volitantes* are owing to the existence of certain *filaments*, as well as *grains*, which, by possessing refractive powers different from the refractive power of the aqueous humour in which they float, cast their images on the retina.

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[*] Op. cit. p. 113.

[†] Dissertation sur les differens Accidens de la Vue, in his Mémoires de Mathematique et de Physique, p. 262, Paris, 1694; and in Mémoires de l'Académie Royale des Sciences, Tome ix. p. 574, Paris, 1730.

Porterfield[*] adopts De la Hire's notion with scarcely any alteration. Neither of them speaks of the supposed grains or diaphanous particles as constituting the filaments, or as situated in their interior; but even were either of these conditions admitted, the limited motion of the muscæ, so often referred to, is inconsistent with the idea of the cause being free and unattached, as De la Hire and Porterfield appear to suppose.

*Exp.* 10. Let the glass-blower blow a globule of an inch in diameter, and fill it with common water. Look through it at a candle some feet distant, and the motions of the corpuscles contained in the water, will be seen at once to be of a very different character from those of the pearly spectrum, and indeed of any of the spectra we discover by experimental examination of the eye. On the slightest agitation of the glass-globule, the corpuscles in the water are flung about, so as to cross each other in every direction, and with much greater rapidity, than is ever exhibited in the motions of the pearly spectrum. The latter float as if connected to a film or membrane; the former dance about. uncontrolled by any sort of adhesion.

Plater's hypothesis, though a very unlikely one in other respects, is in one particular conformable to the appearances; for a filament floating in the aqueous humour, but attached, as I presume Plater supposed it to be, by one of its extremities to some of the neighbouring parts, if it could produce a spectrum at all, would be likely, we should presume, to produce one similar in its movements to those of the pearly muscæ. He tells us, he became suddenly affected one day with the sensation of a black round spot, about the size of a lentil, flying before his left eye, but not impeding vision. He supposes it to have arisen from some ligament of a ciliary process having become loosened from its connections, and to be swimming in the aqueous humour, so that it came before the pupil, and thus produced the sensation in question.[†]

Certainly the aqueous humour seems, on a superficial examination of the subject, to be a likely seat of the efficient cause of the pearly muscæ. It is somewhat surprising, that no author has thought of attributing the appearances to the remains of the vessels of the pupillary membrane. The direct experiments already detailed, (Exps. 6, 7,) however, demonstrate that the cause of the pearly muscæ must reside close to the retina.

3. *Humour of Morgagni.*—Prevost[‡] places the cause of the pearly muscæ in the humour, supposed to exist between the crystalline lens and its anterior capsule. He conceives rightly, that the permanency of the appearances precludes any such inconstant

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[*] Treatise on the Eye, Vol. ii. p. 78. Edinburgh, 1759.

[†] Quoted from Plater's Observationes, Lib. i. by Plempius, in his Ophthalmographia, p. 138. Lovanii, 1648.

[‡] Op. cit. p. 250.

cause as small bodies floating in the aqueous humour. Such a cause, he urges, would produce irregular and variable appearances, but could not apply to such spectra as he himself had found to be unchanged for a track of years. He admits, but certainly without any proof, that the apparent descent of the muscæ depends on an actual descent of their cause, from its gravity, within a fluid less dense than itself, in the interior of the eye. Were this granted, the question, no doubt, would be very much narrowed. For if the cause sinks in the eye, and the spectrum seems to the observer to sink, then the cause must be situated before the focal centre of the eye. (§. 21.) Were it situated nearer to the retina than the focal centre, then, the cause descending, the spectra would appear to rise. The reverse of this, I think, is most likely to be actually the case, the corpuscles or filaments which produce the appearance of the pearly muscæ being probably extremely fine, and of less specific gravity than the vitreous fluid.

Limited by his arguments to the parts situated between the aqueous humour and the focal centre of the eye, Prevost fixes on the humour of Morgagni, which, he says, lubricates the capsule of the lens at its anterior part. "We can conceive," says he, "in that humour, situated between the crystalline and its capsule, a concretion of very small size, capable of intercepting the rays, and several such concretions may adhere together, or be connected by a filament. The movement of fixing the eye upon an elevated object may, by a slight pressure, make these opacities rise; whilst, again become free during the rest of the eye, steadily fixed, their specific gravity, a little greater than that of the humour, brings them slowly to their former situation."

The following considerations will set at rest, I think, the view of the subject adopted by Prevost.

*1st*, There is no such fluid as the humour of Morgagni in the healthy state of the crystalline body. On the contrary, the capsule adheres closely to the lens.

*2d*, Even the capsule itself, when torn to shreds, as it is in the operation of division of the cataract, unless greatly thickened by disease, is of less specific gravity than the aqueous humour, so that after the lens is absorbed, we sometimes observe portions of the capsule, fixed below but free above, floating up into the pupil. I cannot conceive the filaments upon which pearly muscæ depend, to be nearly so dense as the capsule.

*3d*, Pearly muscæ often remain visible after the operation for cataract, the capsule having been divided, and the lens removed by extraction or absorption, so that the seat assigned to their cause by Prevost is no longer in existence.

While we reject entirely, then, this part of Prevost's doctrine, we must not omit noticing his statement, that semitransparent bodies within the eye might affect the retina, some of them by the *refraction* of the rays of light, and all of them by its *diffraction*, the coloration resulting from the latter cause being little observable at so small a distance.* That the pearly muscæ are shadows, magnified by diffraction, seems extremely probable; and although their edges do not appear coloured to the generality of observers, we shall find that this is not always the case.

4. *Vitreous humour.*—It is the opinion of Aepinus, Young, Wardrop, Weller, Andreæ and Brewster, that the cause of *muscæ volitantes* resides in the vitreous humour.

Aepinus† thinks that any obstacle placed before the pupil, or close behind it, in the crystalline or elsewhere, conformably to the laws of dioptrics, might prejudice the clearness of the image painted at the bottom of the eye, but could not project a picture of itself on the retina. This leads him to regard the vitreous humour, close to the retina, as the seat of the cause of *muscæ volitantes*. The argument, however, is not perfectly conclusive, for transparent globules, or even opaque filaments, placed in the aqueous humour, admitting that they could not form images on the retina simply by the light reflected from them, might still be capable of doing so by the light refracted by them, or diffracted by their edges, exactly as the mucus and tears occasionally do, which lie on the cornea, and form the muco-lacrymal spectrum already described. (§ 7, 8, 9.)

Aepinus disproves the notion, that muscæ, or, at least, that all muscæ, depend on a paralytic affection of the retina, by an optical observation, which he acknowledges to be difficult of execution, on account of the muscæ not being situated in the optic axis, and which must therefore be made by attending to a particular spot while not directing the eye towards it. He tells us, that the spots or muscæ, which he observed, appeared to be of two kinds; the one resembling knotty threads interwoven in various ways, and transparent, like lymphatic vessels; the other, round and semi-opaque, like smoke or a thin cloud.

" In the latter kind of spots," he says, " I observed a peculiar phenomenon, which seems to show distinctly what is the nature of these spots. If, for instance, the line FG (Fig. 6,) separates some certain opaque body HFGI from a transparent one FGKL, which is vividly illuminated by light passing through it, and the eye is so placed that some certain spot falls by its one-half ADC upon the opaque body, and by its other half ABC upon the transparent body, the part ABC will appear as if covered with a cloud, but the part ADC, which ought to appear opaque, appears also sensibly illuminated, so that the opaque space does not appear to be separated from the transparent by the straight line FG, but as if it were bounded by the line FADCG, composed of two straight lines and a semicircle.

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* Op. cit. p. 254.

† Novi Commentarii Academiæ Scientiarum Imperialis Petropolitanæ, Tom. x. p. 291. Petropoli, 1766.

"This phenomenon seems scarcely compatible with the opinion which regards this disease as a paralytic affection; for were it such, the space ADC could in nowise appear illuminated, but rather its appearance ought to be as if the opaque body were terminated by the line FABCG, not, as it always is, by the line FADCG. It is to be concluded, then, conformably to the laws of dioptrics, that there is some obstacle present in my eye, situated behind the aperture of the pupil, and near the retina, which impedes some rays in their passage, and irregularly disperses the rest."

The appearance here described by Aepinus is what we should expect to be produced by a semitransparent body, situated at some distance anterior to the retina, and viewed by bringing an opaque screen so far across it, that the edge of the screen should apparently coincide with the centre of the spot. It is to be observed that Aepinus does not say that ABC was quite dark, and ADC quite light. On the contrary, we would infer that the whole circle appeared dark, compared with the illuminated portion FKLGCBA, and decidedly less dark than the adjacent opaque space GIHFADC. But, in the circumstances supposed, ABC would appear darker than ADC, because the contrast with the adjacent illuminated space would be stronger. The inference drawn by Aepinus seems quite legitimate. If the dark spot, ABCD, in the field of vision, dèpended on a corresponding spot in the retina having lost its sensibility, or having its sensibility impaired, it is very difficult to conceive that the portion of *it* covered by the shadow of HFGI should appear *less* dark than the other portions of healthy retina, also covered by the shadow.

"As the whole eye, near the retina," says Aepinus, "is filled with the humour called vitreous, we may be certain the seat of the disease is to be sought for nowhere else than in this body. But as the substance of the vitreous humour contains, without doubt, very fine vessels, carrying a very clear lymph, it seems indubitable that the spots, of which I have been speaking, arise from an extreme dilatation of those vessels, by which it happens that there enter into them certain thicker parts, which are opaque, and refract the light differently from the lymph which they carry in the natural state; in short, I hold those spots to be as it were a varix of the lymphatic vessels."

Young* remarks, that *muscæ volitantes* "are sometimes, if not always, occasioned by an opacity of some of the vessels of the vitreous humour, near the retina. They are seen," says he, "in a full light, and cannot, therefore, as Sauvages has justly remarked, be caused by anything in the anterior part of the eye, and they may often be observed to change their form with the motions of the eye, which they could not do if they did not depend on some floating substance."

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* Introduction to Medical Literature, p. 167. London, 1813.

In that portion of his *Icones Ophthalmologicæ*[*] which has been published, Weller, although he introduces his distinction of three genera of myodesopia, namely, the *local*, the *inflammatory*, and the *nervous*, describing the appearances of the first genus, and illustrating it by accurate representations, yet says nothing of the seat of *muscæ volitantes*. In the fourth edition, however, of his Treatise on the Diseases of the Eye,[†] (and it may be in the third, or in the second edition, neither of which I have seen,) he briefly states it as his opinion, that only the blood globules and the walls of the capillary vessels of the vitreous humour can produce the appearances of *muscæ volitantes*.

Those who believe that no lymphatics have been detected in the interior of the eye, will of course regard the opinion of Young and Weller as more probable than that of Aepinus. Mascagni alone has asserted the existence of lymphatics in the hyaloid membrane.[‡]

Mr Wardrop tells us, that muscæ "arise from different causes, and depend either on a morbid condition of the retina, or an opacity of some of the parts of the eye which are naturally transparent. In the latter case," says he, "the opacity must be in the posterior part of the vitreous humour, because experiments and the principles of optics prove that no opacity of the aqueous, crystalline, or anterior part of the vitreous humour can throw a partial shadow on the retina."[§] Now, the muscæ which depend on a morbid condition of the retina are carefully to be distinguished from the pearly muscæ, which arise from corpuscles situated anterior to the retina. The former are fixed, the latter floating. As for the optical part of Mr Wardrop's statement, it is too loosely expressed, and has thereby attracted the critical observation of Prevost, who remarks that "an opacity, although very small, if sufficient to interfere with some of the rays of light, will inevitably affect the image." To settle the question, he took an artificial eye, and placed on the anterior surface of the lens which represents the crystalline, a fragment of a black wafer, sometimes in, sometimes out of the axis; and in both cases there was projected on the retina a black shadow or image, which he had no difficulty in detecting. There is a difference, however, between such a fixed shadow as would be thrown on the retina by an opaque spot in the surface of the crystalline, the form of which would be altogether irrecognisable by the eye, and the diffracted mobile shadow which produces the definite sensation of *muscæ volitantes.*

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[*] Fasciculus, i. Lipsiæ, 1824.

[†] Die Krankheiten des menschlichen Auges, p. 368. Wien, 1831.

[‡] Descrizione delle Tavole citate nel Prodromo della Grande Anatomia. Tav. ix. Fig. 18, p. 52. Milano, 1821.

[§] Essays on the Morbid Anatomy of the Human Eye, Vol. ii. p. 223. London, 1818.

Andreæ, the author of an elaborate communication* on our present subject, in which he carefully distinguishes the fixed from the floating muscæ, concludes from the peculiar motions of the latter, that they must have their seat not in any fixed part of the eye, nor in one partaking merely in the movements of the eyeball, but in a part which is moveable in itself and more or less fluid. He thinks the crystalline, confined within its capsule, to be too little moveable to explain the phenomena; while the two other media must be affected with an undulatory motion when the eyeball moves. The undulations of the aqueous humour he regards as too free, to correspond with the limited motions of the muscæ, the equable rising and falling of which he thinks can take place only in the vitreous humour. He holds the pearly muscæ, then, to be the shadows of opaque bodies floating in the vitreous humour and thrown upon the retina. In answer to the question, what those bodies are, he says they might be supposed to be blood-vessels, were it not that they do not ramify as blood-vessels do, but are merely single filaments twisted. He conjectures, that they may be depositions in the hyaloid membrane, affecting its transparency, as capsular cataract affects that of the crystalline capsule.

Our knowledge with respect to *muscæ volitantes* has been materially advanced, in several particulars, by the observations of Sir David Brewster, who includes under that general appellation the spectra which I have described (§ 12, 13, 14, 15, 16, 17, 18, 19, 20,) as the watery, the insulo-globular, and the pearly. Referring, doubtless, to these different spectra, without particularly discriminating them, he states that the cause why *muscæ volitantes* appear not only in different planes, but of four or five different sizes, arises from the filaments and spherical particles, whose diffracted shadows form the muscæ, being placed at four or five different distances from the retina, those which give the sharp, black, and minute shadows being placed near the retina, and those which are large and ill-defined at a greater distance from it. This being granted, it necessarily follows, that the vitreous humour is the seat of the cause of the muscæ, as no other part of the eye could afford space for the filaments and particles being so disposed in a series of planes. We could conceive the filaments and particles, no doubt, to be of different sizes, as well as situated at different distances from the retina, but this supposition would afford no explanation of the muscæ appearing the one set behind the other.

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* Gräfe und Walther's Journal der Chirurgie und Augen-Heilkunde, Vol. viii. p. 16. Berlin, 1825.

The limited motions of the muscæ are explained by Sir David to arise from the filaments and particles which give rise to them, being contained in the cells of the vitreous humour. "These various bodies," says he, "though they change their place, still preserve their general distance from the retina, thus clearly indicating that the vitreous humour is composed of cells within which the filaments and *muscæ* are lodged." He regards his experiments as demonstrative of there being at least four or five cells between the retina and the posterior surface of the crystalline lens. "The limited motion of the muscæ indicates," he says, "that the cell in which they float is of very limited extent." The motion, however, is perhaps not so limited as Sir David seems to suppose. On turning the eyes suddenly upwards, the filaments must sink through an extent of considerably more than 30°, and on fixing the eyes at that elevation above the horizon, they rise again so much, that their spectrum sinks entirely out of view. (§ 21.)

5. *Between the hyaloid and the retina.*—Hellwag and Steifensand place the cause of *muscæ volitantes* between the hyaloid and the sentient part of the retina.

Hellwag[*] was affected with both floating and fixed muscæ, and has described his case with great clearness. To account for the floating muscæ, he supposed a peculiar moveable fluid between the vitreous humour and the retina, without being able, as Andreae remarks, either to refer expressly to any such fluid, or to make it probable that such a fluid existed.

Steifensand[†] supposes, that in the motions of the eye there is an undulation or separation of the hyaloid from the retina, which, however slight, will be sufficient to cause a movement of the corpuscles situated in or between those membranes, and thus produce the appearance of floating muscæ. He seems to think that the corpuscles are seated in what he styles the *serous* lamina of the retina, that is to say, on its concave surface.

6. *Retina.*—St Yves,[‡] having adopted the notion of Mariotte, that the choroid and lenticular ganglion form the sentient organ of vision, and that the retina serves merely as an epidermis, to moderate the impressions of light on the choroid, supposes the cause of *muscæ volitantes* to be a partial separation of the retina from the choroid, in consequence of a dilated state of the blood-vessels of the former. This causes, he says, an elevation or fold of the retina, which hinders the light in its passage to the choroid, and pro-

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[*] Referred to by Andreae. op. cit. p. 21.

[†] Ammon's Monatsschrift für Medicin, Augenheilkunde und Chirurgie, Vol. i. p. 208. Leipzig. 1838.

[‡] Nouveau Traité des Maladies des Yeux, p. 331. Paris, 1722.

duces a shadow which the patient sees in the air. This detachment he supposes to take place in several parts, and hence the multiplication of the muscæ.

Boerhaave* and Plenck† follow implicitly the dictate of Pitcairn, (§ 4,) that nothing floating in the eye can form an image on the retina, and that therefore the cause of muscæ must be insensibility of certain portions of the retina itself.

Rosas‡ admits, that *muscæ volitantes* may arise from partial opacities of the vitreous humour or the crystalline, effusions of lymph in the posterior chamber, a turbid state of the aqueous humour, and small central leucomata of the cornea, but evidently regards the retina as the texture which is generally affected. He represents myodesopia as originating in a congestion of blood, and pressure on the nervous substance within the eye, followed by varicose dilatations of the blood-vessels, and by thickening, induration, and other morbid changes of the retina.

Langenbeck, in his lectures on ophthalmology, makes a distinction, we are told,§ between that variety of myodesopia in which spots are seen flying before the eyes, and that in which certain immoveable appearances are perceived. The former he refers to an inordinate turgescence of the vessels, or even to certain nervous affections of the retina; and the latter to a morbid change in certain portions of the membrane itself.

Rudolphi‖ was of opinion, that muscæ depend on a sort of cramp or oscillation of the retina, similar to what takes place in many other parts, only that here visual appearances are the result. Hence, he thought, the endless changes in the form of the figures seen—a false fact, for muscæ present no such protean character.

That the pearly muscæ are not the result of any affection of the retina, such as insensibility of its fibres, caused by the pressure of its vessels in a dilated state, or by such vessels preventing the access of light to the sentient parts of the retina, appears fully proven by the real motions of the muscæ—a fact which can be explained only by supposing that the cause is floating in one of the moveable parts of the eye. As I have already noticed, also, the double images of the pearly and other entohyaloid muscæ seen in *Exp.* 7, set at rest the question as to the nervous or proper substance of the retina being the seat of the disease; for, were it so, no double image of the muscæ could be produced. I shall not pretend to decide that the cellulo-vascular lamina may not sometimes be the texture in fault, especially in cases where the cause is no farther from the sentient part of the retina than $\frac{1}{83}$th of an inch, which is one of the measurements of Sir David Brewster. (§ 23.)

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* Praelectiones publicae de Morbis Oculorum, p. 57. Gottingae, 1746.

† Doctrina de Morbis Oculorum, p. 201. Vinnae, 1777.

‡ Handbuch der theoretischen und practischen Augenheilkunde, Vol. ii. p. 509. Wien, 1830.

§ B. C. R. Langenbeck, de Retina Observationes Anatomico-Pathologicæ, p. 159. Gottingæ, 1836.

‖ Grundriss der Physiologie, Vol. ii. Erste Abtheilung, p. 239. Berlin, 1823.

Besides, vision is not affected by the entohyaloid muscæ. Between the several portions of the muscæ, and by the side of them, the eye still sees everything with perfect distinctness, which could scarcely be the case were the disease the result of any morbid condition of the sentient texture of the retina. Even the portions of this membrane, over which the shadows which cause the appearances of the muscæ fall, are found by the patient, when the corpuscles ascend out of the field of vision, to be perfectly sensible.

7. *Choroid.*—The arguments now stated apply also to the conjectures of Ware and Tyrrell, that *muscæ volitantes* depend on certain diseased states of the choroid coat, affecting the retina.

Ware* considered it probable, that muscæ depended "on a steady pressure on one or more minute points of the retina which are situated near the axis of vision." He supposed such pressure might be produced by "small portions of lymph diffused irregularly between the choroid coat and the retina; by some minute particles of the *pigmentum nigrum*, larger or more uneven than the rest, or by one or more of the villi of the choroides itself."

Tyrrell† referred the cause of *muscæ volitantes* to a preternatural dilatation of some of the vessels of the choroid. "I cannot consider them," says he, "when of an evanescent character, (which nearly all the varieties occasionally are,) as the result of a morbid deposit; because I hardly conceive that such a deposit could take place, and again be removed with a rapidity equal to the appearance and subsidence of the muscæ." The evanescence here attributed to *muscæ volitantes*, like the endless changes in their form ascribed to them by Rudolphi, is a false fact. It is probable that neither Rudolphi nor Tyrrell had any personal experience of the disease.

## § 23. *Size of the elementary filament of the pearly spectrum. Its distance from the retina. Structure of the vitreous body.*

Every spectrum appears larger, in proportion as the ground upon which it is viewed is more remote from the eye; while its angular magnitude, of course, still continues the same. The size of the convoluted or agglomerated muscæ is quite indefinite. Sir David Brewster informs me, that a musca, which he sees, "would cover the moon, for it consists of a knot of filaments." But it is an interesting question, what is the size of the elementary or single filament of the pearly spectrum, or rather of the globules, by the concatenation of which the pearly thread is formed? Sir David, by looking through a very minute aperture at two bright sources of light, obtains, by two divergent beams, double images on the retina of all objects placed within the eye-ball, and by this means determines the diameter of the musca or its filaments, its distance from the retina, its locality, and the form of the cavity by which its excursions are limited. "The filaments or muscæ in the anterior part of the vitreous humour," he says, "will have their double images very distinct: *those* in the middle of it will have their double images much nearer: those near the retina will have their two images close or perhaps overlapping each other; while any object on the retina itself, any black spot arising from defective sensibility, will have only one image, as it were. Now, if we measure the distance of the two sources of light from each other, and also their distance from the centre of visible direction, when the two images of the filaments, &c. are just in contact, we may determine the size of the filament and its exact position, as well as its distance from the retina. In making this experiment, I first found that the angle of apparent magnitude of the shadow of the filament, A, B, C, [referring to an elementary filament,] was eight minutes, and, consequently, that it subtended this angle at the centre of visible direction. Now, if we take the radius of the retina as 0·524 of an inch, the diameter of the shadow of the filament will be 0·00122, or $\frac{1}{820}$th of an inch, and its distance from the retina 0·0118, or $\frac{1}{85}$th part of an inch."

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* Op. cit. p. 264.

† Practical Work on the Eye, Vol. ii. p 19. Lond. 1840.

I have tried to find the diameter of the shadow of an elementary filament which I see with my right eye, by projecting the spectrum of it upon a micrometer, and marking its apparent size. It measured $\frac{1}{800}$th of an inch, which is not very far from Sir David Brewster's calculation.

Sir David speaks of the cells of the vitreous humour, between the retina and the back of the lens, as being only four or five in number, and yet very small, and the motions of the filaments within them of very limited extent. It seems extremely probable that the motions of filaments placed so close to the retina as $\frac{1}{85}$ inch will be very limited; but if there are no more cells than four or five between the retina and the back of the lens, they cannot be very small. The structure of the vitreous body still requires to be specially investigated. Exceedingly fine and transparent filaments have been detected[*] within it, and even fine membranous laminæ, pale, and finely granulated, as I am informed by Mr Wharton Jones; but any thing like cells has never been made out. The following fact would lead me to doubt the existence of the alleged vitreous cells; or, if they do exist, they must be very easily broken up. In a disease which I lately had occasion to describe,[†] namely, *postfebrile ophthalmitis*, I repeatedly observed an effused film of a whitish colour, probably lymph, waving in the vitreous humour. Its excursions were far from being limited in the way we should expect, were the vitreous body made up of small cells. On the contrary, as the head was bent from side to side, the film traversed a space equal to at least a quarter of the diameter of the eye-ball. This was very apparent when the pupil was dilated by belladonna.

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[*] Pappenheim's Gewebelehre des Auges, p. 182. Breslau, 1842.

[†] London Medical Gazette, Vol. xxxiii. p. 226. London, 1843.

### § 24. *What are the filaments and corpuscles in the vitreous humour which cause the watery, insulo-globular, and pearly muscæ?*

Upon this point, we are not only left entirely to conjecture, no decisive observations, either in the living or in the dead subject, bearing upon it, but objections occur to every supposition which can be suggested.

As by means of proper experiments (§ 12), the pearly spectrum is rendered visible to all eyes, whether young or old, (and the same holds, I believe, with respect to the watery and the insulo-globular,) the efficient cause, or object seen, can scarcely be the result of disease, however much the being sensible of these spectra to the extent of what is termed *muscæ volitantes*, must be admitted to be the effect of some abnormal condition of the eye.

I have already referred (§ 21), to the opinions of Aepinus, Young, and Weller, respecting the nature of the filaments which produce pearly muscæ; the first supposing them to be varicose lymphatics, and the others blood-vessels.

" Were they fixed or regularly distributed," says Sir David Brewster, speaking of the filaments in question, " we might regard them as transparent vessels which supply the vitreous humour; but, existing as they do in detached and floating portions, they resemble more the remains of some organic structure whose functions are no longer necessary."

I have already noticed Andreæ's objection, viz. that the filaments, though twisted, are single, and not ramified, as blood-vessels are—an objection with which I cannot altogether concur, for the pearly muscæ often present a branched appearance.

Sir David Brewster has pointed out an error, into which I fell in the first edition of my Practical Treatise on the Diseases of the Eye. When I published that edition, I had not been troubled with *muscæ volitantes*, but drew my account of them from patients who had consulted me respecting them. On the authority of some of these, I stated that the globules of the pearly muscæ are sometimes seen in motion, within the tubes which seem to contain them. I was led to conjecture, from this statement, that the globules, seen in the pearly muscæ, were nothing else than blood-globules passing through the vessels of the retina or of the vitreous humour. I by and bye found, by my own experience, that the globules had no progressive motion, and, of course, corrected my former statement in my second edition.

The observation of Sir David Brewster, that the filaments, existing in detached and floating portions resemble more *the remains of some organic structure, whose functions are no longer necessary*, than vessels actively engaged in nourishing the vitreous humour, tallies remarkably with the two following facts:—

In the *first* place, the globules, seen in the pearly muscæ, are at rest in the tubes, within which they seem contained.

In the *second* place, the artery or arteries which traverse the vitreous humour, or *capsular* arteries, as they are often called, generally two in number, springing from the central artery of the retina where this vessel enters the cavity of the eye, and passing through the vitreous body to the posterior capsule of the crystalline, although undoubtedly occupied by circulating fluid in the fœtus, have never been injected in the adult, but are always in a contracted, and, according to some anatomists, in an obliterated, or ligamentous state.

Sir David Brewster was perhaps not aware of the latter fact, which coincides so remarkably with his conjecture. In the vitreous humour, and stretching from the entrance of the optic nerve, forwards and outwards to the back of the crystalline, there lie what we may call the exuviae of *an organic structure whose functions have ceased*, consisting of filaments or contracted blood-vessels, none of them likely to exceed $\frac{1}{500}$ inch in diameter, and most of them probably much smaller. It does not seem unreasonable to suppose these filaments partially filled with arrested blood-globules, more so perhaps in some subjects than in others, and capable of being refilled on certain occasions. The appearance, too, of globules within tubes, as is seen in the pearly muscæ, is such as we might suppose minute vessels and blood-corpuscles to present, each globule seeming to be supplied with a central nucleus.

Still we must receive all this as mere conjecture, to which every objection which can be started must be weighed. Dr Schroeder van der Kolk states,* that the vessels in question vanish completely in the adult. Were this the case, the above conjecture would fall to the ground, and we should be forced to seek for some other probable efficient cause of the phenomena. I believe, however, that after immersing the vitreous body in alcohol, the obliterated vessels will always be found, surrounded by the prolongation inwards of the hyaloid membrane called the *canalis*

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* Anatomisch Pathologische Opmerkingen over de Ontsteking van eenige Inwendige Deelen van het Oog, en bijzonder over Choroiditis als Oorzaak van Glaucoma. Amsterdam, 1841.

*hyaloideus*. Home noticed[*] the *canalis hyaloideus* in the ox as bearing a resemblance to a lymphatic vessel.

The exterior surface of the hyaloid membrane is covered with blood-vessels, especially in the fœtus, as is mentioned by Arnold.[†] Schroeder van der Kolk describes four arteries, under the name of *vasa longa membranæ hyaloideæ*, which branch out from the central artery of the retina, upon the external surface of the vitreous body. If we suppose even a very slight mobility of the hyaloid membrane, the diffracted shadow of these vessels on the retina might account for the appearances of the pearly muscæ, while the insulo-globular and the watery might be ascribed to the remains of the capsular arteries.

Guttone[‡] distinguishes two varieties of muscæ volitantes, the one with good, and the other with bad sight. He places the seat of the former in the humour of Morgagni, and ascribes the latter to a breaking loose and a waving of the hyaloid membrane within the vitreous body, where, however, no distinct membrane is to be found, but merely exceedingly fine laminæ and filaments. (§ 23.)

Andreæ's conjecture I have already mentioned, namely, that opaque depositions in the hyaloid membrane throw their shadows on the retina, and thus cause muscæ. The corpuscles and filaments, however, which cause the pearly, as well as the insulo-globular and watery spectra, are transparent. The partial opacities which they produce is the result of their peculiar action on light, as I shall presently explain. (§ 25.)

Donné[§] detected the same sort of globules in the vitreous humour which he saw in the aqueous.[‖] As the appearance of a tube, containing globules, in the pearly muscæ, may be entirely the result of diffraction, the whole phenomena of the insulo-globular and pearly spectra may be referred, with much probability, to a concatenation of transparent globules attached to the hyaloid filaments. The watery spectrum, viewed neither with the naked eye, nor through a fine aperture, exhibits any appearance of globules, and is therefore likely to depend simply on fine transparent filaments in the anterior part of the vitreous body.

The suspicion that muscæ volitantes are caused by entozoa in the vitreous humour, seems to have been seriously entertained by Nordmann,[*] while Neuber, it is stated by Himly,[†] proposed to kill the creatures by galvanic shocks passed through the eye! But the motions of muscæ volitantes are excited only by those of the eye-ball, and bear no resemblance to the voluntary movements of an animal. Besides, the filariæ, monostomata, and distomata, which have been detected in the human eye, have all been resident in the crystalline, none of them in the vitreous humour.

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[*] Philosophical Transactions for 1798, p. 339. London, 1798.

[†] Anatomische und Physiologische Untersuchungen über das Auge des Menschen, p. 107. Heidelberg, 1832.

[‡] Ammon's Zeitschrift fur die Ophthalmologie, vol. ii. p. 47. Dresden, 1832.

[§] Op. cit., p. 114.

[‖] Mr Wharton Jones, whose character as a microscopic observer in physiology and pathology stands so high, informs me that the number of corpuscles in the aqueous and vitreous humours is very considerable, some being elementary granules, but most of them resembling one stage of the lymph corpuscle. Most of them measure between $\frac{1}{4000}$ and $\frac{1}{5000}$ inch in diameter. They are of less specific gravity than the fluid in which they are contained.

Parfait-Landran supposes[‡] that, in one case, he discovered in the living eye the bodies which cause muscæ volitantes. The patient saw black points and other spectra with his right eye, such as Demours describes. On examining the eye, Parfait-Landran observed minute bodies dancing within the eye, of a phosphoric splendour. On dilating the pupil by belladonna, he convinced himself that the bodies in question were in the vitreous humour. He says they resembled powder of liquorice, and that some of them shone like fine gold filings. On allowing the eye to rest, they fell to the bottom of the vitreous humour, and rose again on the least motion of the eye, then becoming visible to the patient. This is, no doubt, a curious and anomalous case, but cannot be regarded as throwing any light on the cause of muscæ volitantes. I once saw the crystalline, after I had divided it for cataract, resolve itself into thousands of shining silvery atoms.

## § 25. *Action of the filaments and corpuscles, which cause muscæ, on light.*

Sir David Brewster agrees with Porterfield, in regarding the filaments and corpuscles which cause muscæ volitantes, as transparent; but differs from him as to their mode of action on light. Porterfield[§] conceives that the rays which pass *through* the corpuscles and filaments, having their *refraction* thereby increased, will be made to meet nearly at the retina, where they will form luminous figures with dark and shady borders, just as a convex lens when exposed to the sun, forms its luminous focus in the middle of a very strong shade with which it is environed. On account of their perfect identity with the phenomena of the *diffraction* of light, produced by transparent fibres and films of different forms, Sir David Brewster, on the other hand, ascribes the appearances seen to shadows, formed on the retina by divergent light, passing *by and through* transparent filaments and particles; a view of the matter which had already occurred to Prevost.

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[*] Mikrographische Beiträge zur Naturgeschichte der wirbellosen Thiere. 1es. Heft, p. 24. 2es. Heft, p. xi. Berlin, 1832.

[†] Krankheiten und Missbildungen des menschlichen Auges, vol. ii. p. 464. Berlin, 1843.

[‡] Revue Médicale, Tome iv. p. 203. Paris, 1828.

[§] Treatise on the Eye, vol. ii. p. 78. Edinburgh, 1759.

When Sir David says "divergent light," he refers to those experiments by which the light which falls on the retina is made to diverge from a point within the eye-ball. No doubt, the muscæ are seen very distinctly when we look through a fine aperture, or through a lens, so as to produce divergent light within the eye; but the phenomena of diffraction are visible when the rays of light are convergent or parallel, as well as divergent, and so also are the pearly muscæ. Indeed, the identity of the phenomena of the pearly muscæ with those of diffraction by fibres, is more strikingly displayed when the muscæ are regarded with the naked eye against the sky, than in any other way of viewing them. What appears, when seen through a minute aperture, as a string of globules, assumes, when viewed against the sky with the naked eye, the form of a tube, with a central dark line running through the middle of it, the result, no doubt, of the two streams of light, which flow round the filament, interfering with one another. Sir David Brewster states, that the two lines bounding the filaments which he sees are coloured, and have, on the outside of each of them, one or more coloured fringes,—another circumstance which is to be referred to the interference of light.

The identity of the phenomena displayed by muscæ volitantes with those of diffraction by fibres may be shown in various ways. The following is one of the easiest:—

*Exp.* 12. In front of a convex lens of one-fifth of an inch focus, place any fine fibre, such as one of silk, cotton, wool, or glass, and through the lens direct the eye towards a candle at the distance of twenty feet. The rays of light, passing by the edges of fibres, are diffracted, and a magnified image of the fibre is seen, bearing a close resemblance to the appearance of the pearly muscæ, when viewed with the naked eye against the sky. The shadow of the fibre presents a number of parallel streaks or fringes, alternately light and dark. The central line is narrow and light.* On each side of this line is a broad dark stripe, then a light stripe on each side, then a narrow dark stripe. The dark stripes are the consequences of certain of the rays which bend round the fibre interfering with one another; while the other rays combine and produce the light stripes.

The sharply defined insulo-globular spectrum is also plainly referrible to the diffraction of light by minute spherules; but the obscurely defined insulo-globular and the watery spectra betray much less distinctly alternate rings or stripes, owing, no doubt, to the comparatively greater distance at which they are placed from the retina, or screen on which the diffracted shadows are thrown, and which, to display distinctly the phenomena resulting from interference, requires to be at a certain determined distance from the body whose shadow it receives.

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* This is evident enough in the experiment; but, probably from its extreme minuteness, the central light line is not perceptible in the pearly muscæ. At least, I have never been able to detect it.

I have already mentioned (§ 18,) that the threads of the pearly muscæ sometimes seem to terminate in dark bulbous extremities, which Weller supposes to arise from one end of the thread turning itself, so that it points towards the retina. It is much more probable that the appearance in question is owing merely to the fringes widening, and becoming convex, as they always do at the angular termination of the bodies which cause them, or assuming the crested form described by Grimaldi, as they do when the termination is rectangular.

### § 26. *Subjects of the pearly muscæ volitantes.*

Speaking of the filaments by which *muscæ volitantes* are produced, Sir David Brewster observes, that "as they exist in all ages, whether young or old, they are neither the result of disease, nor do they indicate its approach." Certain it is, that the pearly spectrum is recognisable by all eyes, when sought for through a pinhole, or through the eye-glass of a compound microscope. (§ 12.)

It is also true, that the same objects which produce pearly spectra are seen by many individuals, who do not make any formal complaint of *muscæ volitantes*, or ever fancy that they are affected with any disease of their eyes. "I was consulted," says Demours, "not long ago, by a lady, who was firmly persuaded that these floating phantoms, which she had begun to perceive, would lead to blindness. I found in her house twenty persons, whom I begged leave to question: out of the twenty, seven had seen them for a great number of years, without having ever spoken of them: one young person added, that she amused herself greatly in seeing them descend in the air." * "These muscæ," says Weller," are evidently not observed, or are entirely neglected by those, who, taken up by business, want leisure to think of their disease." On the other hand, they are never so troublesome as when they coexist, either with some other affection of the eyes, such as asthenopia, or with disease of some other organ, such as dyspepsia. Any disorder which unfits one for exertion, and leads to brooding over one's complaints, such as hypochondriasis, is extremely apt both to lead to the detection of *muscæ volitantes*, and to fill the mind with apprehensions regarding their result.

### § 27. *Condition of the eyes of those affected with entohyaloid muscæ.*

The eyes of those troubled with the *muscæ volitantes*, which we have hitherto described, present no objective symptoms, by which the existence of such an affection can be detected. Yet eyes of normal conformation are seldom subject to *muscæ volitantes.* On the contrary, when a person complains much of this symptom, we always find him myopic or presbyopic; or perhaps myopic with the one eye, and presbyopic with the other.

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* Traité des Maladies des Yeux, Tome iii. p. 422. Paris, 1818.

The pupil of an eye affected with muscæ is generally small, even when the eye is myopic.

When the one eye is myopic, and the other presbyopic, the muscæ seen by the former appear smaller than those seen by the latter, and do not display so strikingly the striped appearance arising from interference.

If the over-refraction of a myopic eye is compensated by a concave glass, or the under refraction of a presbyopic one by a convex glass, the muscæ seen by those eyes become somewhat less evident for the time.

These facts show, that however true it may be, that the pearly muscæ are the result of diffracted shadows thrown upon the retina, and are not seen, as Porterfield believed them to be, by rays which pass through dense particles having suffered a greater refraction than those which pass by them, yet the interception of the rays, proceeding from external objects, by the filaments in front of the retina, or even the formation of magnified shadows by diffraction, produces comparatively little effect when the remainder of those rays are brought accurately to focal points upon that membrane. Dilution of the images of external objects favours the perception of the muscæ, which, in their turn, are, to a certain extent, extinguished in perfect vision.

## § 28. *Exciting causes of entohyaloid muscæ.*

Most of the patients who complain of pearly muscæ ascribe the origin of the affection to some exciting cause. It is extremely probable, however, that in many instances there is merely a coincidence, in point of time, between the circumstances blamed by the patients and their first remarking the existence of the muscæ, and no such relation as that of cause and effect.

The following are among the exciting causes most frequently mentioned.—

1. Over-use of the eyes upon minute objects, as in reading, writing, painting, and the like. As often connected with this cause, may be mentioned intense application of the mind. Nor are the want of proper exercise and the bent posture of the body to be omitted as concurrents.

A gentleman, who had been a few years in practice as a surgeon, and who had attended my lectures on the eye, came to me, complaining of muscæ. On inquiring whether he could trace them to any cause, he told me that he ascribed them to his having positively read through Cooper's Surgical Dictionary, a large book printed in a small type. He died not long after of apoplexy.

Charles Bonnet consulted Van Swieten about pearly muscæ which he saw, and which he attributed to too much use of the microscope. Van Swieten replied, that having employed the microscope himself too frequently, when a young man, in the examination of anatomical injections, he had brought on the very same appearances as his correspondent.*

Hanmann says,† he brought on myodesopia by straining his eyes in the study of Greek, at a period when they were already weakened by previous disease.

Nothing serves so much to increase the perception of *muscæ volitantes*, as often searching for them through pinholes, lenses, &c. Such experiments seem to rouse them into existence, and he who has thus brought himself to discover them, continues to see them, and cannot get quit of them. "Almost all the mathematicians and all the microscopical observers that I know," says Walther,‡ "have *muscæ volitantes*, which is, therefore, an appearance referrible to the strained state of the eye, and the too great use of sight."

2. It is a common opinion that muscæ are a sign of congestion in the head and eyes, and often the precursors of apoplexy. Overuse of the eyes probably acts detrimentally, by producing congestion; and other influences, likely to cause a determination of blood to the brain, are sometimes referred to by patients, as having brought on muscæ. Thus, the excitement attendant on sexual connection, while under the influence of wine, was mentioned to me by one patient as the cause which suddenly gave rise in him to *muscæ volitantes.*

3. Febrile diseases are very apt to bring on muscæ, and none more so than the epidemic catarrhal fever, called influenza.

I have already referred to Dr Stark's account of his own case, which is a very interesting one, notwithstanding his confounding together several different kinds of spectra with which he was affected. He attributes the origin of his complaint to a severe course of study while labouring under influenza, and at the same time straining his eyes in microscopic pursuits.

4. Inflammatory diseases of the eyes are frequently followed by the pearly muscæ and their congeners. I have known not only retinitis and iritis to produce them, but even catarrhal conjunctivitis.

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* Mémoires de la Société de Physique et d'Histoire Naturelle de Genève, Tome v. p. 282. Genève, 1832.

† Ammon's Monatsschrift für Medicin, Augenheilkunde und Chirurgie, Vol. iii. p. 427. Leipzig, 1840.

‡ Grafe und Walther's Journal der Chirurgie und Augen-Heilkunde, Vol. iii. p. 19. Berlin, 1822.

5. Want of the due quantity of sleep, the being roused from rest night after night, and above all watching during a number of successive nights, with little sleep even during the day, appear in many instances to bring on myodesopia.

6. Disordered digestion is regarded as a cause of muscæ. Nothing is more common, when such an affection of the eyes is spoken of, than for both patient and practitioner to exclaim, It is the stomach! Certain it is, that the disease is often met with in patients who are labouring under disorder of the stomach and bowels, being troubled with want of appetite, indigestion, acidity, flatulence, and costiveness.

7. Mr Wardrop has pointed out a disturbed action of the heart, as a cause of muscæ.* In consequence of some change in the action of the heart, or of its actual hypertrophy, the blood is distributed, he thinks, unequally to the brain and nerves, and amongst other effects, muscæ, which he terms "ocular spectra," are produced. Agitation of the circulation, a peculiar thrill in the pulse, swimming in the head, whizzing noise in the ears, and increased impulse of the heart, are amongst the attendant symptoms.

8. Another cause to which the origin of muscæ is often attributed, is what is styled nervousness, weakness of the nerves, an impaired state of the nervous system, or a morbidly sensible state of it. Thus, Mr Lawrence speaks of the disease occurring "when the energy of the nervous system is impaired by pressure of business, by anxiety and distress, by severe and continued affliction, or overwhelming grief."†

Mr Ware tells us, that when "a morbid sensibility is excited, like that which general debility or much anxiety is apt to occasion, the retina, (which has a larger quantity of nervous medulla spread over it, in proportion to its dimensions, than any other part of the body,) becomes morbidly impressed by any little points or projections that happen to be in contact with it." A steady pressure, then, on one or more minute points of the retina, along with a morbid sensibility of the membrane, are regarded by Mr Ware as the conditions on which muscæ depend. "The more common exciting cause of these motes," he adds, "appears to me to be too close application of the mind to objects that occasion anxiety or distress."

Before making a few remarks on the exciting causes above enumerated, it may be proper to mention, that the entohyaloid muscæ, independently altogether of the degree of light to which the eyes are exposed, or the general state of body and mind of the person affected, are liable to vary from time to time in number and intensity, although much less considerably and less suddenly than some authors have represented. Hence the question, whether, invisible under ordinary circumstances, they become visible in consequence of an increased sensibility of the retina.

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* Lancet, September 13, 20, 1834, pp. 887. 924.

† Treatise on the Diseases of the Eye, p. 582. London, 1841.

"This supposition," observes Sir David Brewster, "is by no means probable, because the muscæ are not visible by any light of their own, and an increase of sensibility in the retina would affect equally the luminous field on which they are seen. But as this point is of some importance both in a physiological and a medical aspect, I have submitted it," he goes on to say, "to direct experiment. With this view, I examined the muscæ in the morning before the sensibility of the retina had been diminished by exposure to day-light, and found that they were neither increased in number nor intensity. I varied this experiment by diminishing the sensibility of the retina. This was done by holding a bright gas flame close to the eye, and near the axis of vision, till the retina lost its sensibility to all the rays of the spectrum, except a few of the more refrangible ones. In this case, too, the muscæ were as numerous and distinct as before, and we may therefore consider it as certain, that the muscæ described by Mr Ware, in so far as they were of the same character as those in the healthy eye, are not affected by any variation in the sensibility of the retina."

To recur to one of the most certain exciting causes of pearly muscæ, How do the ophthalmiæ, it may be asked, lead to this disease? It is well known, that in every severe ophthalmia, whatever be the texture primarily or principally affected, the whole blood-vessels of the eye become injected. In iritis and retinitis, this is attended with dimness of sight, often to a great degree; in iritis, from effusion of opaque lymph into the pupil, and in retinitis, from a similar effusion on the surface of the retina or into the vitreous body. As the effusion in either case is removed, vision clears, but of *muscæ volitantes* the patient now almost invariably complains. It has already (§ 23,) been stated, as a conjecture, that the most common kind of muscæ, the pearly, may perhaps be the result of the blood-vessels, which run forwards through the vitreous body towards the lens, becoming perceptible, by means of their diffracted shadows, and that the circumstance of their being seen much more by some than by others should be attributed to their obliteration being less complete in some subjects than in others. If this conjecture be true, may not the occurrence of muscæ after a severe ophthalmia be the consequence of the contracted vessels yielding to the push of the blood from the central artery of the retina, of which the vessels in question are branches, so as to readmit a certain quantity of blood, which either remaining there or becoming effused, gives rise to *muscæ volitantes*?

Almost the only cause by which the contracted vessels which advance through the vitreous body could become more visible to some individuals than to others, is what I have just now stated; namely, a partial refilling with blood. Perhaps a minute effusion of blood may sometimes happen. The globules, whether within or without the vessels, will probably form only single rows, so that were either the arteries in question, or the little chains formed by their effused contents, lying before us, out of the eye, they would measure no more than from $\frac{1}{4000}$ to $\frac{1}{5000}$ inch in diameter, and be therefore invisible to the naked eye; but within the eye, close to the retina, and seen by light which is first strongly converged and then diffracted, they may produce the sensation of the insulo-globular or the pearly spectrum.

If we examine into the probable mode of action of the several exciting causes of muscæ, besides the ophthalmiæ, we shall find that all of them have a tendency to produce a determination of blood to the vessels of the head and eyes. Over-use of the eyes upon minute objects, intemperance, the venereal orgasm, a union of these, febrile diseases, extraordinary excitement or actual disease of the heart, it will readily be granted have this tendency. As for disordered digestion, which is often blamed for producing myodesopia, I suspect that in most cases the disorder of the stomach and the affection of the eyes are merely coincident effects, arising from one and the same cause; such as improper diet, neglect of the bowels, a torpid condition of the liver, and very frequently, even when it is least suspected, the use of alcohol, especially in the shape of drams and cordials. Pressure of business, anxiety, distress of mind, and grief, which form another set of exciting causes, operate in all likelihood exactly in the same way, producing, (it may be in persons of feeble health,) congestion of the head and eyes, and filling with blood the contracted capsular vessels.

Nor is want of sleep an exception to the general principle, that all the exciting causes of myodesopia act by producing congestion. Whether watchfulness arises from disease, artificial means employed to produce it, as the use of coffee, which Bereis* particularises as a cause of muscæ, the urgent calls of professional occupation, or prolonged study, it always leads to an irregular action of the circulating system, and an unnatural determination of blood to the organs of vision.

### § 29. *Prognosis in cases of entohyaloid muscæ.*

As the muscæ of this class often occur suddenly, the patient is apt to be alarmed by their appearance, and to suppose that he is about to lose his sight by cataract or by amaurosis. We may calm his fears on these heads, for with neither cataract nor amaurosis have these spectra any connection whatever. Even on the supposition that a gradual increase of the muscæ is to take place, not even the greatest possible accumulation of them can ever end in the production of an amaurosis, and much less of a cataract. It will be well, however, in any case in which the practitioner is consulted, to ascertain whether, independently of the muscæ, there be any symptoms of either of these two diseases present. The presence or absence of cataract we ascertain by the use of the catoptrical test, that is, by moving a lighted candle before the suspected eye, and observing whether the inverted image, formed by the reflection of the light by the posterior surface of the crystalline body, is distinct or not. If perfectly distinct, there is no cataract. We have no such simple or certain test of amaurosis. But if the pupil moves with its natural vivacity, and the patient is able to read a small type with the suspected eye, we may assure him it is not affected with amaurosis.

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* Dissertatio de Maculis ante Oculos volitantibus, Helmstädt, 1795, quoted by Andreæ, op. cit. p. 24.

A question, which the patient is very likely to put to us, is, whether the floating motes and threads which he sees are not liable to increase, and that to such a degree as at length to deprive him of sight. That they increase is true, although only very slowly, and never to such an extent as materially to interfere with vision. Even when the whole field of view presents entohyaloid spectra, the patient is still able to read, although, as he continues to do so, the muscæ sometimes gather together, so as to render portions of the page before him temporarily obscure. Very often they remain stationary for ten or twenty years, or increase by almost insensible degrees; and, although alarming at first, the patient gets habituated to them, and troubles himself no more about them. I believe the increase of myodesopia arises more from the eye becoming in a greater degree susceptible to the impressions of the bodies which cause this disease, than from any increase of the bodies themselves. This increasing susceptibility arises from over-use of the eyes, and from searching for and examining the muscæ too much.

Sir David Brewster takes rather a gloomy view of the matter, when he tells us, that "it is quite possible that some of the cells near the retina and around the optic axis might be filled up with accumulated muscæ, and produce a considerable degree of blindness;" and that, "though these filaments have no morbid character, they may, nevertheless, obstruct and even destroy vision."

The remark, that "these filaments have no morbid character," is founded, I presume, on the fact, that their existence may be detected in some degree by every eye, if recourse is had to the methods formerly (§ 12) described. Arriving, however, to such a pitch as to attract notice as ***muscæ volitantes***, they may fairly be considered as constituting a disease. If this disease consists in seeing the branches of the central artery of the retina, which advances through the vitreous humour towards the lens, or those which ramify over the external surface of the hyaloid membrane, the danger of their filling up any of the cells of the vitreous humour, or accumulating round the optic axis, so as to destroy vision, may be regarded as chimerical. If the corpuscles, which are seen, be an extravasation or deposition from the vessels, certainly we might conceive them accumulating more and more, till they proved a complete barrier to distinct vision; but experience gives no support to such an apprehension.

Many authorities might be quoted to prove, that entohyaloid muscæ increase only with extreme slowness, or remain entirely stationary, and sometimes become even less perceptible.

" I know many people who have complained to me of such things fifteen and twenty years ago, and who are still at this moment in the same state." Maître-Jan.[*]

" These kinds of phantoms, which increase sometimes very slowly during the first five or six years, continue during the whole remainder of life without any kind of inconvenience. * * * I know a great number of persons who have seen them thirty, forty years, and more, without their number or their figure having undergone the slightest change." Demours.[†]

" Twenty-five years after I had been first consulted in this case I again saw the patient. She then enjoyed good health and spirits. The motes were still occasionally perceived, but they had become so faint, that she could only see them in a strong light, and when she took pains to look for them. It ought, however, to be mentioned, that at this time her daughter was just married, whereas, when she first consulted me, she had lately lost her husband." Ware.[‡]

" Twelve years afterwards, I had occasion to see this gentleman again, when he informed me that he retained the perfect sight of both eyes, and could distinguish the most minute objects with either of them. In a bright light, however, he still perceived the motes as before, if he took pains to look for them; but he was now so much accustomed to their appearance, that they did not occasion any uneasiness." Ibid.[§]

" It is certainly for from twenty to thirty years that I have seen these same appearances," says Prevost, at the age of 50; and, at the age of 79, he adds, " Since, up to a very advanced age, I have enjoyed very good sight, I may support, by my case, the opinion of the oculists who reckon these appearances of small importance."*

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[*] Traité des Maladies de l'Œil, p. 281. Troyes, 1711.

[†] Traité des Maladies des Yeux, Tome iii. p. 421. Paris, 1818.

[‡] Op. cit. p. 258.

[§] Ib. p. 260.

"They are quite innocent in their nature, and exist in persons whose powers of vision are most acute. I have been subject to them from childhood." Müller.†

### § 30. *Treatment of entohyaloid muscæ.*

Entohyaloid or floating muscæ are not much under control, and are very seldom removed by medical applications. If of old standing, and not increasing, it is needless to interfere. When of recent origin, and the exciting cause evident, they are sometimes cured.

The treatment most likely to be useful is as follows:—

1. The patient must be put on his guard against the exciting causes, and carefully avoid them; such as, too much straining of the sight, excess of every sort, night-watching, the use of alcohol in any form or quantity, and the like. "The only means which often does good in this disease," says Walther, "is rest of the eyes, and abstaining from every employment which strains the sight. I know patients who have got completely free of *muscæ volitantes* which they had seen for several years, by giving their eyes long-continued rest, which, however, again appeared, as soon as they wrought for some days, so as to strain their sight."‡

2. If the stomach is weak, and the bowels costive, a course of laxatives, followed by tonics, should be prescribed. To strengthen the constitution, and especially the nervous system, should by every likely means be attempted. This indication will best be answered by cinchona, steel, and the cold bath. Richter mentions the case of a lady, who was troubled with this disease after a difficult labour, and who was completely freed of it by the continued use of sulphuric ether. In another case, in which the digestion was much impaired, and the patient troubled with acid eructations, a mixture of ox-gall and assafœtida was of great use.§

3. A torpid state of the liver requires small doses of the blue pill, either by itself or combined with purgatives. I have known a gentle course of mercury successful in curing the disease, probably by its sorbefacient powers. Iodide of potassium, I have also found completely successful in removing *muscæ volitantes* of recent standing.

4. Where the symptoms of determination of blood to the head are well marked, venesection or arteriotomy, leeches to the head or cupping, and counter-irritation are indicated. Of twelve cases

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[*] Op. cit. p. 247.

[†] Elements of Physiology, translated by Baly, Vol. ii. p. 1214. London, 1842.

[‡] Op. cit. p. 20.

[§] Op. cit. 514.

treated by Dr Schlagintweit, eight, we are told, were cured by solvent and derivative medicines, and by bleeding at the foot.* Dr Wallace reports two cases, in which cupping was very beneficial.†

5. When muscæ appear dependent on disease of the heart, leeches are recommended by Mr Wardrop to be applied over this organ till its impulse is diminished. The fulfilment of this indication may be promoted by small doses of antimony and the use of laxatives. If the patient complains of cold feet, the warm pediluvium is to be used at bed-time; and it may be remarked, that this simple remedy is of great importance, where the disease is connected with a difficulty of obtaining sleep. An irritable state of the heart, remaining after its impulse is subdued, Mr Wardrop endeavours to remove by the exhibition of sulphate of iron.

6. Antispasmodics appear to have been chiefly confided in by Ware in the treatment of muscæ; such as, two or three times in the day a small dose of the volatile tincture of valerian, mixed with an equal quantity of tincture of castor, and joined occasionally with the camphor mixture, or with infusion of cascarilla.

7. Exercise in the open air, and a change of residence, with such occupations and amusements as are likely to withdraw the mind from any source of anxiety or distress, are found to be beneficial. A course of mineral waters has sometimes been successful, probably more from the change of scene, hilarity of mind, exercise of body, and regularity of habits, by which such a course is accompanied, than from the effects of the waters themselves.

8. If the eyes feel hot, heavy, or uncomfortable, they should be bathed with either some cold or some warm application, according as the patient feels the one or the other the more agreeable. Cold water, or a cold lotion, consisting of equal parts of water and the *spiritus ætheris nitrosi*, will answer in the one case; tepid water, or a tepid infusion of any aromatic herb in the other. Sponging the forehead, temples, and outside of the eyelids, morning and evening, with camphorated spirit of rosemary, eau de Cologne, or the like, is also to be recommended.

9. Rust, it seems,‡ continued to recommend the practice of puncturing the cornea in cases of myodesopia, a plan originally proposed with the view of allowing the cause to escape out of the eye, and tried unsuccessfully by Demours; but which in Rust's hands was followed, we are told, by the vanishing of the muscæ. If it really was so, the operation probably acted in a similar way as it is known to do in cases of ophthalmia, by giving relief to the turges-

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* Ammon's Zeitschrift für die Ophthalmologie, Vol. ii. p. 47. Dresden, 1832.

† London Medical Gazette, Vol. xxiii. p. 110. London, 1839.

‡ Chelius' Handbuch der Augenheilkunde, Vol. i. p. 371. Stuttgart, 1843.

cent state of the vessels. On one occasion, however, under the care of Dr Helmbrecht, the operation of puncturing the cornea, not merely cured the eye of myodesopia, but gave exit, we are told, to the efficient cause—a microscopic conferva, of the exact shape of the *musca volitans* previously seen by the patient![*]

## IV.—CIRCULATORY SPECTRUM.

### § 31. *Vision of blood-corpuscles moving through vessels of the eye.*

When I look fixedly for a few minutes at the clear sky, I begin to perceive a multitude of lucid points, darting in every direction through the field of view. The motion of these points is real and altogether independent of any movement of the eyeball; and is so exactly like that of the circulation in the web of a frog's foot as seen with the aid of the microscope, that I have no doubt this spectrum is owing to the blood-corpuscles passing through the vessels either of the retina or of the choroid.

On sneezing, coughing, yawning, or straining to evacuate the bowels, it is well known that the eyelids close instinctively, for the purpose of sustaining the eyeball, and preventing the bad effects which these forcible acts of expiration might otherwise have on the delicate textures within that organ, in consequence of the regurgitation of the blood through the veins. The pressure of the eyelids, as they close in these acts upon the eye, often produces a flash of light, similar to the sensation of a luminous spectrum which is experienced when the eyeball is pressed on one side with the finger. But if we happen to sneeze, cough, yawn, or strain with our eyes open, or rather chance to open our eyes during one or other of these acts, the circulatory spectrum becomes very evident, and continues for some seconds.

Purkinje,[†] in his description of what I conceive to be the circulatory spectrum, says, that the lucid points which spring up in the field of vision, without having changed their places, suddenly disappear, leaving behind them black points, which even as suddenly vanish. To my view the lucid points career, as if in pursuit of one another, with a motion, which, though rapid, can still be easily followed. The appearance of black points, succeeding the lucid ones, I have witnessed only after sneezing. Purkinje does not attribute the phenomena he describes under the title of "aufspringende Lichtpünktchen," to the circulation of the blood, but to a conflict of contraction and expansion of the nervous substance. Müller,[‡] on the other hand, considers the appearances as evidently due to the motion of the blood, and remarks, that of the same nature is the much more definite appearance of dark bodies with tails, flying and moving about in all directions, which is sometimes seen by persons labouring under plethora, or congestion of blood in the head, on rising suddenly from the stooping posture. This description, I suspect, refers to the phenomenon denominated "fliegende Mücken" by Purkinje, under which head, instead of the common *muscæ volitantes*, he describes numerous insulated lucid points, which move in different directions through the field of vision, with a shadow on that side of the points which is turned from the middle of the field. His figure represents them with tails. He attributes them to the presence of blood-globules in the aqueous humour. They differ, he says, from the "aufspringende Lichtpünkten," in being visible only when the eyes are open, and a sufficient quantity of light present, whereas the others may be discerned in the dark, and with the eyes shut.

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[*] Revue Ophthalmologique de l'Année 1842, p. 251. Bruxelles, 1843.

[†] Beobachtungen und Versuche zur Physiologie der Sinne, Vol. i. p. 67. Prag, 1823.

[‡] Op. cit. p. 1211.

## § 32. *Upon what set of vessels does the circulatory spectrum depend?*

Were it admitted, that the circulatory spectrum is due to the motion of the blood, it would next become a question, through what vessels of the eye the blood is moving, which produces the appearance? The most ready answer seems to be, The ramifications of the central artery of the retina, which are placed in front of the nervous or sentient substance of the membrane. It may admit of doubt, however, whether it be not rather the blood moving through the vessels of the choroid, which is the cause of the circulatory spectrum, and that for the following reasons:—

1. The circulatory spectrum embraces the centre of the field of view, and must, therefore, affect the vertex of the retina, a part which is generally considered as entirely destitute of vascularity.

2. When we look at the vessels of our own retina, as in the well-known experiment of Purkinje, to which I shall hereafter have occasion more particularly to refer, (§ 35,) they are seen merely as dark lines, without the least appearance of globules, or of lucid points, moving along their course.

For these reasons, although I am aware of the fact, that pressure on the concave surface of the retina is sometimes productive of a luminous appearance, I am, on the whole, more inclined to consider the gentle compression of its nervous substance, or *stratum bacillosum*, by the current of the blood over its convex surface, in the vessels of the choroid, as the cause of the circulatory spectrum.

I shall not stop here, to inquire into the probable connection of this spectrum with the symptom called *photopsia*. I may merely notice the fact, that if any cause operates on either surface of the retina, so as to produce gentle pressure of its nervous substance, the result is a luminous sensation, whereas if the pressure is much increased, the membrane becomes for the time totally insensible.

### § 33. *Sensation of muscæ volitantes produced by the circulatory spectrum.*

A perception of the circulatory spectrum, in the ordinary use of sight, and not searched for by gazing steadily at the sky, is, in some cases, one of the earliest symptoms of amaurosis, degenerating gradually into the sensation of gleams of light, fiery sparks, and coloured coruscations. After a time, the pressure on the retina still continuing and increasing, these luminous appearances are changed for others of a totally opposite character, such as I shall afterwards describe under the head of *fixed muscæ.* (§ 37.)

The following amusing instance of the circulatory spectrum being taken for the effect of actual insects moving in the air, I met with in a newspaper in February 1832, a period when the animalcular origin of Asiatic cholera was a subject of speculation. It is contained in an extract of a letter.

"On my way from Haddington," says the writer, "the day after cholera appeared there, I observed the atmosphere for miles crowded with a small white animal, in colour like a drop of water. I can observe them *here* at present with the naked eye, but not in such numbers. Place yourself opposite the window, and keep your eye fixed steadily on the same point for a minute, you will notice something like water in the air, and then the animalculæ will become distinct, whirling and careering round in all directions. The phenomenon may be common at all seasons, but I must say I never noticed them before."

## V. VASCULAR SPECTRUM. ACCIDENTAL COLOURS. RETINAL AND CHOROIDAL MUSCÆ. FIXED MUSCÆ.

### § 34. *Fixed spectra.*

The fact, that there occur certain *fixed muscæ*, which, once fairly formed, never change their position, either with respect to one another, or to the optic axis, naturally leads us to seek for some natural example of a fixed spectrum, analogous to the prototypes of the various sorts of muscæ already considered, all of which possess a real as well as an apparent motion. The *vascular spectrum*, as produced in the experiment of Purkinje, and the familiar appearances known by the name of *accidental colours*, and which are called forth by subjecting portions of the retina either to greater or to less excitement than usual, are the only examples of the kind required, which occur to me.

### § 35. *Blood-vessels and central spot of the retina as seen in the experiment of Purkinje.*

*Exp.* 18. The eyelids of the unemployed eye, say the left, should not be closed, but the light should be prevented from falling on it, by the hand or any other covering. The right eye, then, being steadily directed forwards, move a lighted candle, (the room being otherwise dark,) slowly upwards and downwards at the temporal side of the eye, or right and left below it. In a few seconds the blood-vessels of the retina, with all their ramifications, are distinctly seen, of a dark hue, projected on a grayish-white ground, as if about a foot before the eye, and greatly magnified.

It is indispensable that the light be in motion, for as soon as it becomes stationary the image breaks into fragments, and vanishes. Although an example of a fixed spectrum, it is to be observed, that during the motion of the light the image also moves, and in a direction contrary to that of the light, a consequence, I presume, of the distance between the vessels and the nervous substance of the retina. No spectrum arises when the light is moved to and from the eye, nor when the eye is alternately shaded and uncovered.

When it is the right eye which is the subject of the experiment, the part of the spectrum corresponding to the entrance of the optic nerve is, of course, to the right hand of the observer, and from that part two vascular trunks are seen to go upwards and two downwards, whence they are prolonged in an arched form towards the left, vanishing towards the middle of the field. The part of the spectrum corresponding to the central spot of the retina, Purkinje describes as presenting a circular concave appearance. Were it certain that the central fold of the retina is actually raised into a convexity towards the vitreous humour, we should regard this appearance as an optical deception, of the same sort as that by which a cameo sometimes seems an intaglio. But anatomists are not agreed to regard the central fold as existing during life. On the contrary, this is denied by Zinn,* Home,† D. W. Soemmerring,‡ and others, and in a dissection of a human eye by Mr Dalrymple,§ a very few hours after death, no fold was detected, but at the usual place of the central spot a minute cup-like depression, with an elevated yellow lip around it.

Purkinje has offered no explanation of this very striking and beautiful experiment. The following attempt to supply the omission, I presume to be from the pen of Mr Wheatstone.‖

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* Descriptio Anatomica Oculi Humani, p. 98. Goettingæ, 1780.

† Op. cit. p. 388.

‡ De Oculorum Hominis Animaliumque Sectione Horizontali, p. 25. Goettingæ, 1818.

§ Anatomy of the Human Eye, p. 293. London, 1834.

‖ Journal of the Royal Institution of Great Britain, Vol. i. p. 111. London, 1831.

"Were the blood-vessels which are spread on the anterior surface of the retina entirely opaque, they would prevent the transmission of light to the nervous matter beneath them, and their distribution would be constantly visible; but they are transparent, and in ordinary cases the intensity of the light which passes through them does not materially differ from that which falls directly on the retina. When, however, the retina is fatigued by a strong light, the veins become visible, because the retina is rendered insusceptible to a portion of the light they transmit; but this effect is only momentary, for those parts which are thus shaded from the more intense light promptly recover their usual susceptibility, and the images vanish; but they may again be made perceptible by displacing them on the retina, and by making them constantly change their places the images may be rendered permanent."

Purkinje and Wheatstone have pointed out methods by which the more minute vessels of the retina may be rendered visible, as well as the central spot. The following is one of the readiest:—

*Exp.* 14. Before one eye, directed towards a plate of ground glass, or sheet of paper, held close before a candle, move from side to side in a tremulous way, a black card with a hole in it, one tenth of an inch in diameter. The image of the light upon the retina being in this way continually displaced, an extremely complicated net-work of blood-vessels appears, of a grayish white colour, in which the ramifications of the upper trunks are seen to anastomose with those of the lower, while in the very centre of the field there is a small dark circle, in which no trace of vessels appears, the spectrum of the central spot.

### § 36. *Accidentul colours.*

Out of the numerous and diversified class of phenomena known by the names of *accidental colours* and *ocular spectra*, I shall select, as an example, one of the simplest.

*Exp.* 15. Out of a card, cut the figure of a triangle, each side measuring an inch in length. Blacken the one surface, and let the other remain white. Lay it on a sheet of white paper, with the black surface up, and look steadily at it for a minute. On moving the eye a little, the figure of the triangle will be seen on a white part of the paper whiter and more luminous than the other parts of the paper.

*Exp.* 16. Reverse the experiment. Lay the figure of the triangle on a sheet of black paper, with its white surface up. After regarding it steadily for a minute, turn the eye to a sheet of white paper, and a black spectrum of the triangle will appear.

In these two experiments, the part of the retina which has received the luminous part of the image remains for a certain period in an excited state, while that part which has received the dark part of the image is left in an unexcited, and therefore excitable condition. Hence, when the eye is turned away from the figure of the triangle, the parts of the retina upon which the dark portion of the previous image had fallen receive a much more intense impression from the surface looked at than those upon which the luminous portions of the image were directed; and hence the inversion of the light and dark parts of the image in the spectra.

If instead of black or white, the object with which the retina is fatigued be coloured, the spectrum is of the colour which is complementary of that of the object, that is to say, the one colour is what the other wants to form white light. Thus, if the retina is fatigued by looking at a red wafer, a bluish-green spectrum will be produced; if fatigued with a bluish-green wafer, a red spectrum will follow. Fatigued by a red object, the sensibility of the retina to red light is diminished, and, consequently, when the eye is turned from the red wafer to the white paper, the exhausted portion of the retina will be insensible to the red rays which form part of the white light reflected from the paper, and will see the paper of that colour which arises from all the rays in the white light of the paper but the red; that is, of a bluish-green colour, which is therefore called the *complementary* colour of red.

In such experiments as those above referred to, the spectrum, though fixed when the eye is at rest, moves with the motions of the eye, upwards or downwards, or from side to side, on our calling into action the appropriate muscles, and this even although the eyelids are shut. If we make an impression on the retina in the manner described, and merely shut the eye, as the pupil is somewhat raised in this action by the eyeball becoming equipoised between the rectus superior and inferior, the spectrum appears in a horizontal direction or a little elevated, and continues so till by a voluntary exertion we turn the eye into some other direction. Immediately on again calling into activity the *orbicularis palpebrarum*, the eyeball rolls upwards, and the spectrum rises.

The spectra in the above experiments are evanescent, but by increasing the light by which they are produced to an intense degree, they may be rendered more or less durable. Thus, by looking at the image of the sun reflected from a mirror, Sir Isaac Newton produced a luminous spectrum edged with colours, to get quit of which he was obliged to shut himself up in a dark room for three days.* Buffon tells us, that one of his friends having looked at an eclipse of the sun through a small hole, observed a coloured image of that body upon all objects for more than three weeks.†

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* King's Life of Locke, Vol. i. p. 405. London, 1830.

† Mémoires de l'Académie Royale des Sciences, pour 1743, p. 155. Paris, 1746.

### § 37. *Persistent spectra. Fixed muscæ.*

There is reason to believe, not only that *fixed muscæ*, as they are termed, bear, in some instances, a resemblance to the spectra of which we have been speaking, (§ 35, 36,) in their form and in the sort of affection of the retina upon which they sometimes depend, but that they are in certain cases nothing else than persistent spectra, the consequences of over-excitement of the nerve of vision, and exhaustion of its sensorial power. Buffon's own case may be quoted as an instance of this kind.

"I have seen," says he, "black points for more than three months, in so great a number that I was very uneasy about them. I had apparently fatigued my eyes in making and too often repeating the preceding experiments, [on accidental colours,] and in looking sometimes at the sun, for the black points appeared at that very time, things which I had never seen before. At last they annoyed me so much, especially when in broad day-light I looked at objects strongly illuminated, that I was obliged to turn my eyes away; yellow especially was insupportable to me, and I was obliged to change the yellow curtains in the room which I occupy, and to put up green ones. As I avoided looking at all colours which were very strong, and at all brilliant objects, gradually the number of black points diminished, and at present I am no more troubled with them. What convinced me that those black points arose from too strong an impression of light, is that after looking at the sun, I always saw a coloured image which for a certain time covered all objects, and watching with attention the different gradations of this coloured image, I observed that it lost its colours by degrees, so that at last I saw upon objects only a black blotch, at first pretty large, but which gradually diminished, and ultimately was reduced to a black point."*

Some fifteen years after the attack above described, Buffon, who studied much and was very short-sighted, had another, commencing with photopsia, followed by the spectrum of a dark ring or disk before his left eye, covering all objects and preventing him from reading. After a day and two nights it grew less, so as to allow him to see objects to the right and below. For fifteen days he could not see the pen with which he wrote. His eyes then became inflamed, which obliged him to give them rest, and after the space of some months, the spectrum broke up into fragments, and his sight was restored.†

### § 38. *Various appearances of retinal or fixed muscæ.*

Fixed muscæ are sometimes single; often more numerous. They are of different sizes, and present a great variety of forms.

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* Mém. de l'Académie Royale des Sciences, pour 1743, p. 156. Paris, 1746.

† Histoire de l'Académie Royale des Sciences, pour 1760, p. 55. Paris, 1766.

They are not always fixed from the very first, but after affecting one side of the optic axis may shift to the opposite side, a fact indicating perhaps their dependence on an effusion of blood from the retinal vessels. They are sometimes semitransparent at first, but afterwards their colour is generally black, or at least much darker than the colour of the floating or entohyaloid muscæ. They are often so black that even when both eyes are open, although the musca affects only one, a person's countenance standing before the patient seems obliterated, or his head cut off, or the flame of a gas-lamp extinguished. Their colour changes, however, in a remarkable manner, appearing of a grayish-white while the eye is shut, and instantly assuming a velvet black colour on opening the eye in the light. Sometimes on shutting the eye the musca is seen of the colour of the object which last impressed the retina.

White objects, in consequence of fixed muscæ, sometimes seem to have black, ill-defined, large blotches on them. Sometimes the patient sees the appearance of black letters, like T or X, for instance, in the air. In other cases, he describes himself as seeing through a riddle, the interstices of which become gradually less and less, till the disease ends in total blindness.

A fixed musca, occupying the centre of the field of vision, and gradually expanding its circumference, ends in one of the most intractable varieties of amaurosis. It is to be attributed to a change of structure in the central spot of the retina, the evident result, in some instances, of over-excitement of the eye in the continued observation of minute objects. "The appearance I see," said a literary man to me, who was losing his sight, "is that of a dark wafer covering the middle of objects. It is getting broader and broader, for formerly I could read past the edge of it, but now I cannot."

Müller tells us, that the vascular figure, observed in Purkinje's experiment, is sometimes seen with a luminous character. "I have frequently seen," says he, "this luminous ramified figure in the dark field of vision, when, after ascending a flight of stairs, I have found myself suddenly in a dark place, and also when I have suddenly immersed my head in bathing. The luminous appearance is evidently the effect of the pressure of the vessels filled with blood upon the retina."* Now, moderate pressure on the retina always produces a luminous sensation; but if the pressure is increased, darkness is the result. Patients sometimes mention the appearance of a spider, with its legs stretched out from it, as a spectrum which they observe; but this, I believe, will generally be found, when the patient is directed carefully to examine it, to be a pearly or floating musca. Were it ascertained in any case to have no real motion, and not to throw a double image on the retina when exposed to two divergent beams of light, we should be led to ascribe it to a varicose state of the blood-vessels of the retina. That this was the cause of a peculiar appearance in a poor woman who was under my care, completely amaurotic of one eye, and fast losing the sight of the other, seemed not improbable. "For some time," said she, "I have seen like two bushes before this eye, and now the two are meeting."

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* Op. cit. p. 1211.

As the eyeball moves, the fixed musca seems to move with a corresponding velocity. The figure of a mouse running along the floor is a spectrum, which I have known to arise from an insensible portion of the retina, and to be the precursor of total amaurosis. The distinction, then, of the fixed from the floating muscæ, requires considerable attention and power of observation on the part of the patient. Sometimes he is affected with both sorts. Thus, Hellwag tells us, that on looking through a pinhole in a card, he saw two sorts of appearances, viz. five fixed dark spots, which changed their position with respect neither to one another nor to the optic axis, together with a semitransparent moveable web of twisted chains.*

### § 39. *Vascular diseases of the retina probable causes of fixed muscæ.*

That the diseased state of the blood-vessels of the retina, in which they become suddenly distended much beyond their natural diameter, or even give way, so that blood is effused on the surface, or into the substance of the membrane, (*apoplexia retinæ*,) may, by compression, give rise to a partial abolition of vision and to fixed muscæ, is generally admitted. The same is likely to hold true of partial dilatation of its arteries and varicose enlargements of its veins. The central artery has been met with in a state actually aneurismal.

### § 40. *Fixed muscæ from partial paralysis of the retina.*

It has been presumed that the nervous substance of the retina is liable to become insensible in certain portions of its extent, altogether independently of any affection of its blood-vessels. Andreæ compares this supposed state of the retina to the condition of the brain in nervous apoplexy, and calls it a loss of power from want of sufficient vital support. He says, that the muscæ depending on this cause vanish for a time, under the influence of different physical and moral stimulants, such as a jovial meal, a glass or two of wine, or a cheerful conversation.

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* Op. cit. p. 21.

§ 41. *Fixed muscæ from melanosis and neuromata of the retina.*

It can scarcely be doubted, that both the small black points, which, in certain cases, are deposited on the concave surface of the retina, constituting what is termed *melanosis retinæ*, and the larger red bodies, which, in other cases, are met with on its convex surface, and are called *neuromata*, must give rise to fixed muscæ.

The younger Langenbeck relates the case of a man, long and exceedingly troubled with muscæ. On dissection, neither the aqueous humour, carefully preserved, and examined with the microscope, nor the lens, nor the vitreous humour, showed any thing unnatural. The retina, to the naked eye, and the coats of the eye, seemed normal. The vessels of the retina were not enlarged, and were neither more numerous nor fuller of blood than usual. On examining the retina microscopically, the whole internal surface was seen to be covered with blackish or brown points, formed apparently of molecules of *pigmentum nigrum*, accumulated into little globules, about ten times bigger than the medullary globules of the retina. They were disposed equally, and in a certain sort of order, over the retina, following chiefly the course of the blood-vessels. They were detected in each retina, but were blacker and more numerous in the left.

The patient was never altogether free from myodesopia, although, at certain times, especially after drinking spirits, the disease increased. Certain of the phantasms which he saw floated before his eyes; others, and these the more numerous, remained fixed. In writing, he complained that the paper seemed sprinkled over with snuff, and so similar were the spectra which he saw to grains of snuff, that he often tried to brush them away.

The little tumours, called *neuromata*, appear to arise from chronic retinitis; they cover the convex surface of the retina, being of a red colour, pellucid, and somewhat prominent; some of them are visible to the naked eye upon dissection, being twice as big as poppy seeds, others so small as not to be seen without the microscope. They are mixed with black points, and surrounded by striæ of *pigmentum nigrum*. Some of them are depressed in the middle into a sort of umbilicus, and have a black point within. They are imbedded in the cortical substance of the retina, and may perhaps be morbid enlargements of the medullary globules of the retina. The cellulo-vascular layer of the retina, in such cases, is thicker and firmer than natural, of a whitish colour, furnished with red vessels, and easily separable from the other layers. Such is the account of this morbid state of the retina, which is given by Langenbeck.*

It is merely a conjecture, that neuromata will in an early stage cause fixed muscæ. Ultimately they produce complete amaurosis, or, at any rate, are met with in eyes which were completely deprived of sight.

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* Op. cit. p. 170.

We cannot be too cautious in coming to conclusions respecting the pathological states likely to give rise to certain symptoms which affect vision, or on the other hand respecting the symptoms likely to attend certain morbid alterations of the retina. Retinitis, for example, which, contrary to what might perhaps be expected, is not attended with pain, produces, by an effusion on the concave surface of the retina, a general dimness of sight, and after this abates under treatment, the appearance, not of fixed, but of floating muscæ. Neuromata, being seated on the convex surface of the membrane, are more dangerous to vision than melanosis, which, on the other hand, is more apt to produce fixed muscæ, without causing total blindness. The intimate relation which exists between the different portions of the retina, considered as a sensorial surface, and the reciprocal action which they have upon one another, are probably much stronger on the convex than on the concave side of the membrane, belonging, in fact, more to its nervous than to its vascular structure. Hence, neuromata may, by irradiation, produce complete amaurosis, while melanosis merely causes fixed muscæ. The melanotic points, although extremely numerous, do not destroy vision, because they are seated in the least important of the textures of the retina; the neuromata, although fewer, so as to leave numerous spaces where the natural substance of the retina is probably uninjured, abolishes sight entirely, from the morbid condition of one part of its nervous matter having a certain influence on the neighbouring parts, as is well known to be the case with respect to the retina in the healthy state.

### § 42. *Diseased states of the choroid probably productive of fixed muscæ.*

If we are obliged to speak with some reserve even of the retina, as the seat of the efficient causes of fixed muscæ, with still less confidence can we assign such causes to the choroid. Necroscopic observations are here entirely deficient, so that we can state it merely as a probability, that partial thickenings of the choroid, dilatations of its vessels, or depositions on its surfaces, by pressing on the retina, may cause photopsia in the first instance, and afterwards fixed muscæ.

### § 43. *Diseased states of the optic nerves, and of the brain, probably productive of fixed muscæ.*

As diseases of the optic nerves, and of the encephalon, cause luminous sensations, even after the eyeball is extirpated, so they are the causes of dark spectra, and of partial amaurosis. Disease of the brain is well known to produce hemiopia.

Dr Delafield relates* the case of an elderly gentleman, who afterwards became totally blind, one of whose early symptoms was, that in walking he imagined he saw objects on the ground which intercepted his path, and which he endeavoured to avoid by taking long and high steps. These spectra were perhaps fixed muscæ. On dissection, the eyes seemed in all respects sound, and had the plumpness and clearness of health. No mention is made, however, of any microscopical examination of the retina. The ventricles of the brain were greatly surcharged with fluid and the optic nerves to and from the *ganglion opticum* [chiasma ?] shrunk, or rather absorbed; so that they appeared flat, and were of a straw colour. Only the sheath of the nerve remained, the medullary substance having entirely disappeared.

### § 44. *Symptoms coincident with fixed muscæ.*

In most of the cases in which fixed muscæ are a prominent symptom, there will be found a combination of various other subjective symptoms; such as photopsia, or the sensation of coruscations and haloa of light; floating muscæ; the retina unnaturally retentive of impressions; ocular spectra; the alternate disappearance and reappearance of small objects; hemiopia; partial and oblique vision; chrupsia; the sensation of an undulating cloud before the eyes, with occasional openings in it, through which small objects are seen by fits, and then are obscured again; bright objects exhibiting a tremulous, undulating light and shade; the edges of objects ill defined and shaggy, as if fringed with hoarfrost; perpendicular lines appearing disfigured, printed letters broken or indented, and circular objects deprived of their regular figure. What belongs to the fixed muscae must not be confounded with what depends on other causes. An interesting case of this mixture of symptoms, the reader may find recorded by the patient himself, Mr Keir, in the Lancet for October 1, 1842. The case of Professor Boze affords another example of the same thing. Besides the sensation of a disc before one of his eyes, objects appeared curved, misshapen, and fringed; letters seemed broken: objects were as if coloured blue and green; the disc grew broader and more opaque, and at last the vision in one-half of the retina was extinguished, the other half seeing as if through a thick fog.†

### § 45. *Treatment of fixed muscæ.*

Most of the cases of fixed muscæ are incurable, as may be concluded from the nature of the efficient causes upon which they depend. The cases susceptible of treatment are most likely to be benefited by depletion of various kinds, mercury, iodide of potassium, and counter-irritation, followed up by general and local tonics, so as to relieve the over-distended state of the vessels, and restore them to their natural diameter. If the disease arises from the suppression of any habitual discharge, an attempt should be made to renew this, or to procure a substitute for it. The best local application is cold water, applied to the eyes and face by means of folded pieces of cloth. Richter remarks, that by this means alone, the disease has sometimes been completely removed; an instance of which, indeed, seems to have occurred in the case of Boerhaave, as thus related by himself. "In aestu solis summo mihi equitanti per loca arenosa enascitur magna macula in fundo oculi. Cogitanti succurrit mihi, medicamentum optimum fore aquam frigidissimam, quae a me applicata remedio fuit: Inflammatio ergo procul dubio erat in fundo oculi, et saepe etiam fit tali in casu, hinc optimum remedium est, quod subito retropellendo omnia vasa constringit, ut aqua frigida."* The length to which this paper has extended must be my excuse, for not entering into a detailed consideration of the remedies above mentioned.

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* Notes and Additions to Travers' Synopsis of the Diseases of the Eye, p. 514. New-York, 1825.

† Histoire de l'Académie Royale des Sciences pour 1760, p. 54. Paris, 1766.

## § 46. *Conclusion.*

I must here quit the highly interesting and important subject, the present amount of our knowledge of which I have thus attempted methodically to digest and arrange. While I have endeavoured, as much as possible, neither to introduce extraneous notions into the consideration of it, nor to exclude any part of the case before us, I am fully sensible that much remains to be investigated respecting the VISION OF OBJECTS ON AND IN THE EYE, and that, in fact, by attempting thus to discriminate what is strictly known upon the subject from what is merely conjectural, I have done little else than pioneer the way for still more strict and scientific inquiries. "In rebus quibuscumque difficilioribus non expectandum, ut quis simul, et serat, et metat, sed praeparatione opus est, ut per gradus maturescant."

Fig. 1. Illustrating experiment 2d, p. 42.
Fig. 2. Showing the appearance of the pearly spectrum, (*a*); the watery spectrum, (*b*); and the insulo-globular spectrum, (*c*), p. 48.
Fig. 3. Showing the appearance of the tubulated spectrum, p. 53.
Fig. 4. Illustrating description at p. 54.
Fig. 5. Illustrating experiment 10th at p. 58.
Fig. 6. Illustrating description at pp. 62 and 63.

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* Op. cit. p. 62.

*Glasgow, 30th December* 1844.

## ART. III.—*On Inflammation of the Membrane of the Aqueous Humour of the Eye.* By ALEXANDER WATSON, M.D., F.R.C.S.E., Consulting Surgeon to the Royal Infirmary, and Surgeon to the Eye Infirmary, &c. &c. Edinburgh.

THE general characters of the *ophthalmiæ* had been observed by the earliest physicians, and by them handed down from generation to generation until our own times, with very few additional observations.[*] It has therefore been reserved for the nineteenth century to make those nicer and more important specific distinctions which characterise the ophthalmic surgery of the present day. And although in this path the German surgeons led the way, yet those in Britain have not been slow in employing their talents and acute observation to extend our knowledge of these diseases, as well as to apply their judgment and skill in giving precision to the treatment of them.

To the accounts given concerning those diseases of the eye, which have been so elegantly described and delineated by Dr Wardrop, in his essays on the Morbid Anatomy of the Eye, published about thirty years ago, very little has since been added. But some of these diseases have been subdivided into species and varieties; several additional morbid conditions have been described; and the treatment of ophthalmic diseases generally, has been more completely detailed, in the numerous systematic treatises which have been published since the commencement of the present century.[†]

The internal *ophthalmiæ* or inflammation of the internal parts of the eye, were, in consequence of their obscure symptoms and difficulty of their investigation, the latest to be recognised and described. They are also the most important, being the most dangerous to vision; yet their presence is not easily detected, and they are often insidious in their invasion, while they are at the same time tedious in their progress and difficult to remove.

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[*] Galenus *de locis affectis*, iv.

Paul of Aegina, Book iii. xxii. The medical works of Paulus Aegineta, translated into English, with a Copious Commentary by Francis Adams, Esq. surgeon. London, 1834, 8vo.

Banister, Richard. A Treatise of 113 Diseases of the Eyes and Eyelids. London, 1622, 12mo.

Maitre-Jean. Traité des Maladies de l'Oeil et des Remedes propres pour les guerir. Troyes, 1707, 4to.

St Yves. Nouveau Traité des Maladies des Yeux. Paris, 1722.

Janin. Memoires et Observations anatomiques et physiologiques sur l'Oeil et sur les Maladies qui affectent cet organe, etc. Paris, 1772.

Benedictus, Traug. Gul. Gust. de Morbis Oculi Humani Inflammatoriis. Lipsiae, 1811, 4to.

[†] See the Treatises of Travers, Lawrence, Mackenzie, Tyrrell, Middlemore, and Watson.

Indeed, when they are of a chronic character, they may proceed to a considerable extent before their existence is suspected by the patient or recognised by the surgeon; owing to the sight being very gradually impaired, and the eye presenting to an ordinary observer little or no visible morbid change.

Another important peculiarity of the internal *ophthalmiæ* consists in the disease being seldom confined to one part of the organ. One part or texture may at first be affected, but very soon the neighbouring parts participate in it. This extension of disease is readily accounted for by the close and intimate connection which exists between the internal parts of the eyeball, and their dependence on each other. A striking illustration of this was lately afforded in the cases which we had an opportunity of seeing, of internal *ophthalmiæ* which occurred after the *epidemic fever* which prevailed here as well as in Dublin and Glasgow. A slow insidious inflammation of the internal parts of the eye in some cases supervened during or after convalescence from the fever, in which it obviously attacked first the retina, then extended to the choroid coat, the iris, vitreous humour, and cornea, in succession, without causing much pain, or inducing the appearance of inflammation externally, though vision was generally much impaired.

Inflammation of the serous membrane which encircles the aqueous humour of the eye is alluded to by Dr Wardrop only as a highly probable occurrence in the first volume of his essays; but is more fully described in the 2d volume, as also in the 4th volume of the Medico-Chirurgical Transactions. Still, the accounts of the disease there given are imperfect, and the modification of it about to be described is not mentioned.

This disease we find afterwards described by Baron von Rosas of Vienna, under the name of *kerato-iritis*.

In the year 1825, I had the honour to submit, to the Medico-Chirurgical Society of Edinburgh, a short account of an affection of the eye, under the name of chronic inflammation of the iris, which was afterwards published in the Transactions of the Society. (Vol. ii.) I adopted this name because the most obvious morbid changes were observed in the iris; although I at the same time stated it to be my opinion that, the disease might rather be considered to be an affection of the membrane of the aqueous humour.

The disease which I described in the essay referred to, consisted in chronic inflammation affecting the more delicate internal parts of the eye, producing effusions of lymph in the chambers of the aqueous humour, followed by irregularity in the form and contraction of the pupillary aperture of the iris, accompanied by loss of sight, to a greater or less degree, according to circumstances. The complaint was also described as insidious in its invasion, slow in its progress, and, in the cases which I had seen, (which has been of old standing) intractable in its treatment. It also showed the analogy which existed between this and inflammation of the serous membranes of other parts of the body.

Since that time I have had many opportunities of verifying my remarks. But by an improvement in the glasses used for examining such diseases, I have been of late enabled to extend my observations so as to acquire a more intimate knowledge of some of those diseases, whose distinctive characters are so minute that they elude the powers of unassisted vision.

By Dr Mackenzie the disease under consideration is described as "a rare ophthalmia," under the title of *Aquo-capsulitis*, in his Treatise on the Eye, published in 1830; but the description of the disease and its treatment are chiefly taken from the essays of Dr Wardrop.

Allusion is made to this disease by Mr Lawrence in his Lectures on the Eye, published in the Lancet in 1826, (Lect. XVI.) But a more full and complete account of it is given in the second edition of his Treatise on Diseases of the Eye, published in 1841.

The disease is also shortly described by Mr Tyrrell in his work on the Eye, published in 1840.

Having premised this account of the history of that species of internal *ophthalmia* affecting the membrane of the aqueous humour, I now proceed to describe a frequent and interesting modification of the disease, attention to which is of much practical importance; for if, on the one hand, it is detected in its early stages, it may be completely cured; while, on the other, if it is allowed to proceed without being recognised and proper remedies applied, it is certain to terminate in causing great imperfection of the sight, or in producing complete blindness.

Perhaps the best mode of explaining the symptoms, characters, and progress of this disease, and its appropriate treatment, is, in the first place, to select a few cases, and then to make a few remarks upon them.

Case I.—A. B., aged 20. A young lady of delicate constitution; has frequently had attacks of ophthalmia in spring.

August 26th. Is affected with chronic inflammation of both eyes, which has existed during the last four months. The sight has become very obscure, of both eyes, but especially of the left. There is a deep-seated red zone around the cornea of both eyes, and a few enlarged conjunctival vessels are seen to proceed forwards to the cornea. This increased vascularity of the eyes is easily augmented by any cause of excitement, by the exercise of the organs, or by the application of cold.

The lower part of the cornea of both eyes, but particularly the left, has a slight hazy or nebulous appearance; but when examined by a strong magnifying glass, the cornea is studded over with distinct, round, whitish spots, (about the size of small pin heads when magnified four or five times), giving it a dotted or mottled appearance, (see Plate.) These spots seem to consist of lymph deposited on the inner surface of the cornea or membrane of the aqueous humour.

The pupils of both eyes are of an irregular form, which is more conspicuous on the application of belladonna. The pupillar margin of the iris is then seen to adhere at different points to the anterior part of the capsule of the lens, by small masses of effused lymph.

General health somewhat disordered and strength much reduced by spare diet, calomel, &c.

To take quinine and rhubarb twice a day; hydrargyrus c. calce and Dover's powder, in small doses, every night. More full and strengthening diet, consisting of animal food and wine, and belladonna to be applied every second day. Is also to use frequently a collyrium of acetate of lead and camphor.

September 4th. Has continued the above treatment, which has required no change on account of the progressive improvement which has taken place. The increased vascularity is now gone; the vision is much improved; the pupils are more regular in form; the spots on the cornea are now much fewer and smaller; and her general health is much improved. To use warm poppy fomentations when any increased excitement takes place.

September 24th. Continued the same treatment, but has taken less of the mercury of late, on account of the mouth having been sensibly affected. The opaque spots on cornea are gone; right eye nearly well; pupil of left still somewhat oval when belladonna is applied. To discontinue the medicines gradually.

October 25th. Is better than she has been for several months past.

November 17th. Is now nearly quite well. No specks on cornea; pupils natural; vision and general health much improved.

CASE II.—A. F. æt. 18, a copper-plate printer, of somewhat delicate but healthy appearance.

October 21st. Complains of dimness of sight, particularly in the left eye. There is a deep-seated red zone around the cornea. When examined with a magnifying glass, numerous small round opaque spots are seen on the inner surface of the cornea at its lower part. These are more numerous on the left eye, the pupil of which is of an oval form when belladonna is applied. Some pain about the forehead.

States that the complaint came on eight days ago without any evident cause. The loss of sight is much greater than could be accounted for by the spots on the cornea.

The treatment of this case consisted in small doses of quinine and rhubarb, mercurial pills, blisters, and belladonna, which were continued more or less for several months. At the end of December the report of his case is as follows.

Vision has continued gradually to improve. The opaque spots diminished in size and number till they have altogether disappeared. The proper form of the pupil is now restored, and he reports himself to be quite well.

Case III.—J. F. aged 23, of fair complexion, with yellow hair, and rather delicate appearance.

February 24th. Complains of great dimness of sight, which prevents her from being able to read. The cornea of both eyes, (but especially the right,) is a little hazy or slightly opaque, opposite to the lower part of the pupil. When examined with magnifying glass, the opacity is seen to be caused by small, distinct, opaque points, producing a dotted or mottled appearance. These opaque spots appear to consist of lymph on the inner surface of the cornea. Pupils somewhat irregular in form, and have some adherent points to capsule of lens. Some deep-seated redness forming a zone around the cornea; has no pain.

States that her eyes have been weak for several years, during which time they have often been slightly inflamed. During the last two months, her sight has become much more affected than formerly, and now she cannot see minute objects, and sees very indifferently to go about.

To take a blue pill every second night—Quinine and rhubarb morning and evening.
Belladonna to be applied every second or third day.
Lotion of acetate of lead. Moderate diet, with animal food once a-day.

March 17th. Opaque spots much fewer in number. Sight of right eye so much improved that she now sees to read. Mercury has not affected her mouth.

April 5th. Continues to improve.

To take the blue pill every second night. Cont. alia.

May 15. This patient is nearly quite well. The spots have disappeared,—the pupil is larger and of more regular form,—and her vision is very much improved.

These cases sufficiently illustrate the nature and character of inflammation of the membrane of the aqueous humour. In the instances here detailed, the disease was of a chronic character; and was obviously confined chiefly to the membrane lining the chambers of the aqueous humour; affecting those parts which cover the interior of the cornea, the iris, and capsule of the lens. This was manifest from the effusion of small portions of lymph on these parts, causing the mottled appearance of the cornea, and the irregularity of the pupil, from its adhesion to the capsule of the lens.

In other cases of this disease, particularly in young subjects, the symptoms are more acute, and other parts of the organ partake of the inflammation; such as the choroid coat, the cornea, the conjunctiva, and even the retina, accompanied with great intolerance of light. And when these parts become affected, the morbid appearances become so complicated, that the peculiar characters of the inflammation of the membrane of the aqueous humour are masked, and often prevented from being recognised.

In cases of more general inflammation of the eyeball, the membrane of the aqueous humour and cornea are much affected; to such a degree, that the cornea bulges, and forms partial or comlete staphyloma from distension. In some cases the sclerotic coat becomes of a bluish colour, or even staphylomatous.

The disease, in some cases, is much less extensive than in the instances above detailed, and is observed to affect only the iris or cornea. In one instance the mottled appearance was confined to the surface of the anterior part of the capsule of the lens. Repeated relapses, or states of acute inflammation, of short duration, are apt to occur. In some cases, too, there is more obscurity of sight than could be accounted for by the opacity of the cornea; leaving us to infer that other parts, or the retina itself, may be implicated in the disease.

I consider this disease to be a modification of strumous ophthalmia; and that, therefore, it requires very particular attention to the constitutional as well as local treatment.

The indications requiring attention are, 1st, to subdue states of excitement or acute inflammation by local and general antiphlogistic remedies; 2d, to stop the progress of the chronic stage of the inflammation; and 3d, to prevent a relapse by tonics and nourishing diet.

The *first* of these indications is generally answered by topical bleeding, by means of cupping or leeches; the application of warm fomentations and blisters. Purgatives, particularly when combined with antimonials, are very useful auxiliaries. The *second* indication is to be fulfilled by the moderate administration of mercury. But, in the subjects of this disease, mercury requires to be very sparingly given, so as only slowly to affect the system. The *third* indication is to be answered by the giving quinine and rhubarb in small doses two or three times a-day, along with light nourishing diet, including animal food once a-day, and in some cases a small allowance of wine. A combination of quinine and rhubarb seems to me to be the best tonic in cases of strumous ophthalmia, and is the one which I find most generally applicable. But, in some cases, this may not agree, or may, from peculiar circumstances, require to be changed for some others. In such cases, magnesia and rhubarb,—carbonate of soda, with rhubarb or colombo,—or preparations of iron may be used with advantage.

In some cases a *fourth* indication is to relieve excessive distension of the eye, caused by a morbid accumulation of aqueous humour, producing excessive pain of eye, orbit, and head. This is to be accomplished by the puncture of the cornea, as proposed by Dr Wardrop, with a grooved needle, by which the excessive accumulation of fluid is evacuated.

When there is distracting pain from distension of the eyeball, caused by a morbid increase of its humours, by which the ciliary nerves are pressed against the unyielding sclerotic coat, there is no remedy which gives such immediate and complete relief as the evacuation of the aqueous humour, when all other means have failed. If, from continuance of the inflammation, the symptoms requiring it return, the puncture may be repeated with the same beneficial effects in removing the pain and lessening the tension of the eye, which allows the parts to recover from the disease.

Another indication requiring attention is, to obviate irregularity and contraction of the pupil.

The contraction or closure of the pupil is to be prevented by the repeated application of a carefully-prepared solution of extract of belladonna, or a solution of atropine.

In mild genial weather, moderate exercise in the open air during the treatment, and cold bathing when the disease has been removed, are of much importance.

The glasses which I have lately found most useful in examining the characters of diseases of the eye consist of a combination of two plano-convex lenses, of from 1½ to 2½ inches focus. They are to be placed, with the convex surfaces opposed to each other, at a certain distance, so as to form "*Ramsden's* eye-piece." These magnify the object from four to eight times, according to the power of the glasses employed. For the purpose in view a more powerful glass is inconvenient, both by requiring to be held too near to the eye of the patient, so that the light is prevented from falling upon it, and by requiring the eye of the observer to be too close to the patient. The focal distance of the glass when complete should be about half an inch; and a tube, making the instrument altogether nearly three inches long, is an improvement which renders it more convenient. The advantages of this glass are, that it possesses sufficient magnifying power with a very flat field, and is nearly achromatic. The light upon the object may be increased in intensity by being concentrated with another convex lens.

### *Explanation of Plate* I., *Figures* 7, 8, *and* 9.

Figure 7. represents the appearance of the eye of the patient, Case II., when magnified.

Figure 8. represents the glasses, combined and constructed as recommended in the preceding pages. This is the modification which I have devised as most suitable to the purpose in view.

Figure 9. represents another modification of the same, in the form of a small telescope which draws out to the proper focal distance.

The distance to which the lenses are placed from each other is two-thirds of the focal distance of one of them. When so combined, they have the power of a single lens, the focal distance of which is three-fourths of that of one of them.

51 *Queen Street,*
*Edinburgh, May* 1845.

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## ART. IV.—*On Malarial Fevers as observed in Canada from* 1838 *to* 1845. I. *On Malarial Continued Fever.* By THOMAS STRATTON, M. D., Edin.; Navy Medical Department.

THE disease which it is here proposed to call Malarial Continued Fever prevails throughout a great part of South-Western or Upper Canada, and chiefly along the water boundary separating this part of British America from the United States. It is met with along the line of the Rideau canal and the Great Cataraqui river; at Kingston, Toronto, &c. on Lake Ontario; at Queenston and Chippawa, on the river Niagara; at Port Colborne, Port Maitland, Dunnville, &c. on Lake Erie; at Amherstburg and Sandwich, on the river Detroit; at Chatham, near Lake St Clair. After this, the boundary-line still going to the north, the disease is more rare, though it is sometimes seen at Goderich on Lake Huron. It is found at various places around Lake Michigan and on the United States' side of the great lakes. Cases appear first in May, gradually become more numerous in June and July, are most numerous and severe in August, and gradually decline in frequency and intensity during September and October. After the frost sets in, no new cases occur, and any remaining ones speedily recover.

*Symptoms.*—The disease generally commences with a feeling of weakness, impaired appetite, and slight headach; often there is observed by the friends, an irritability of temper or some other unusual mental state. After a couple of days these symptoms increase, so that the individual has to confine himself to bed. There are then morbid heat of the skin, thirst, loathing of food, a bad taste in the mouth, extreme weakness, and languor; headach, sometimes frontal, at other times general, increased by mental exertion, light, and noise, particularly the noise of persons speaking or reading aloud, less so by that of machinery or any other not calling into operation the mental faculties. There is at times slight delirium, mostly at night. During the early part of the disease there is sleeplessness, latterly succeeded by the opposite state of drowsiness. The pulse is weak and quick; the bowels costive; sometimes vomiting of greenish or yellowish fluid. In occasional cases there is pain in the right or in the left hypochondriac region or in other parts of the abdomen; in some instances pain in the chest, with slight cough. These chest-symptoms I have seen only in persons who previously had some affection of the lungs or bronchial membrane; and of urgent local symptoms, those connected with the head are the only ones constant in the disease.

Many cases occur where the head symptoms are not so severe as above mentioned, where there is only slight headach throughout the disease, and little or no delirium; and, on the other hand, there are a few instances of ardent heat of skin, intense headach, followed by drowsiness, sopor, and coma; and the degree of intensity of disease ranges by insensible gradation, from that of mild common continued fever to that of *typhus gravior.*

After ten, twenty, or thirty days of these symptoms the disease terminates in one of several ways. 1. When it is fatal, the chief morbid state is effusion on the surface, or within the ventricles of the brain. 2. The state of continued pyrexia ceases, the patient complains of nothing except weakness, and in about a fortnight or more is restored to health. 3. The continued fever passes into remittent, generally of the quotidian, sometimes of the tertian type, and, when this change has taken place for about a week, it is followed by convalescence. 4. The fever changes first to remittent, and after a few weeks turns to intermittent, which, after several paroxysms, terminates in recovery. 5. The continued pyrexia changes directly to intermittent. 6. It passes directly into irregular periodic attacks of either a remittent or an intermittent character, or of these blended. Of those ways in which the disease may terminate, the first is rare, the fourth and fifth are most frequent, and the others are about equally common.

*State of the Mind.*—Sometimes, before the affection displays a distinct character, there is, as already noticed, an unusually capricious and irritable disposition; in other instances, where this change takes place to a greater degree, the friends are apt to think it the beginning of insanity. The delirium during the disease is the same as that of other fevers. After the fever is over, there is observed, in a few rare cases, a mental alteration for the worse, approaching almost to stupidity; this may go off gradually in a few months, or it may last for a year.

*Sequelæ.*—After recovery, in other respects besides the mental state above mentioned, there is, in some instances, impairment of vision or hearing for a few weeks.

*Complications.*—Sometimes there is affection of the liver, and, if the patient has frequently had ague or remittent fever, there is likely to be enlargement of the spleen. I knew of a case of malarial continued fever, where some chest-symptoms were supposed to be the chief if not the only malady, but, on the exhibition of quinine, the patient quickly recovered; the same was the case where there was affection of the liver, and jaundice; and in another instance, where there was supposed to be some disease of the abdominal aorta.

*Causes.*—This fever is produced by the combined agency of great heat and a moist soil, as the muddy banks and edges of marshes, lakes, rivers, and canals, liable to changes in the height of the water; it is also occasioned by the first few years' cultivation of a soil containing some inches of very rich mould. A person who has had an attack is predisposed, if living in a malarious district, to other attacks and to remittent and ague; if living in a non-malarious country, he is liable to attacks of ague after exposure to cold and wet.

*Diagnosis.*—This fever appears to differ from common continued fever in the following particulars.

| Malarial Continued Fever. | Common Continued Fever. |
|---|---|
| 1. Prevails in malarious situations, or is met with in persons lately there. | 1. Does not prevail particularly in malarious situations. |
| 2. Arises from malaria. | 2. Does not arise from malaria. |
| 3. Is not contagious. | 3. Is contagious. |
| 4. Frequently or generally passes into remittent, or intermittent, or both, using these as steps to recovery. | 4. Does not pass into remittent or intermittent. |
| 5. An attack predisposes to others. | 5. An attack rather lessens the susceptibility of others. |

The severer cases of malarial continued fever differ from *typhus mitior* and *typhus gravior.*

| Malarial Continued Fever. | Typhus. |
|---|---|
| 1. Is caused by residing in or visiting malarious districts. | 1. Is not so caused. |
| 2. Is not contagious. | 2. Is contagious. |
| 3. No eruption on the skin is observed. | 3. An eruption is sometimes observed. |
| 4. Often ends in remittent or in ague. | 4 Never ends in remittent or in ague. |
| 5. An attack predisposes to others. | 5. An attack gives immunity from a second. |

*Prognosis.*—A removal to a healthy part of the country is likely to be followed by recovery. When the fever becomes remittent, the prognosis is rather favourable, and when intermittent, recovery is almost certain. Unfavourable cases are those where the fever remains continued, and where, also, removal is impossible from weakness, local situation, or pecuniary inability; likewise, where an attack follows a few weeks only after a former one.

*Treatment.*—The best measure is removal from the malarious neighbourhood. A popular and correct idea is, that a voyage on the lake is very beneficial, and from most places a patient can easily get water-conveyance. Thus, from most parts on the shores of Lakes Ontario and Erie, he can be easily removed by water to Drummondville, near the Falls of Niagara, a spot free from malaria, and in other respects, also, an excellent place for a sick person. For invalids at Amherstburg and Sandwich a visit to Windsor on the Detroit, or Sarnia on the St Clair is the most convenient. Of travelling in a steamer, the advantage is the quick passage, and the disadvantages are the noise, heat, and internal motion, so that in some cases a sailing-vessel may be preferable. In the public service this change of air is often inconvenient or impracticable, and in private practice also, from the severity of the illness, or the patient's pecuniary inability to remove from home, the disease must often be treated at the spot where it was contracted. When the patient is very ill and also far inland, it is next to impossible to remove him, on account of the present bad condition of Canadian roads.

At the commencement of the disease a single emetic may be prescribed. For the heat of skin cold sponging ought to be employed, and confined to the face and limbs if any chest or abdominal symptoms appear. For the thirst, iced-water drinks are useful, acidulated drinks are grateful; but as they may tend to promote constipation, they had better be avoided. After but little effect from the previous remedy, there may be tried in succession for the headach, cutting short the hair, cold affusion, shaving the scalp, purgatives, venesection, a blister, or leeches, or cupping the nape of the neck. Some patients object much to shaving the scalp, but their reluctance ought not to be indulged, if the headach is still considerable on the third day. Except at Toronto and Kingston, leeches are not easily procured in West Canada. By all the above measures the headach is not entirely removed, but continues in some degree throughout the whole course of the disease. Mental excitement and the irritation from light and sound must be guarded against. The bowels require to be acted on at first by cathartics, and then almost daily by purgatives or laxatives. During the state of continued pyrexia, half a grain of tartar-emetic may be prescribed thrice daily, from day to day, as long as no sinking appears. When there is much nausea and little vomiting an ipecacuan emetic may be prescribed; when the vomiting is of an ordinary amount, it may be left to itself; when too violent, it must be checked by opium or a sinapism or blister. Pain in the chest is best treated by a sinapism, and this failing, by a blister. The same may be said of any abdominal pain.

When the fever has proceeded for twenty or twenty-five days, and there is great weakness, it is advisable to give a small quantity of wine five or six times a-day, and of wine in this province, sherry is to be preferred, as it is less adulterated than port. After the disease has continued for ten or fifteen days or longer, and when the violence of the fever has subsided, some experimental use may be made of quinine. If it appear that at any time of the day there is rather less pyrexia than another, a grain or two of it in solution may be given and its effect watched; and if any improvement seem to follow, a larger dose may then be prescribed. This diminution of pyrexia may be looked for towards the middle of the day. When the disease assumes a remittent, or intermittent, or an irregular periodic type, quinine is to be given in the absence of the paroxysms.

The above is the treatment required in whole or in part in most cases; but occasionally additional measures are called for. Yellowness of the skin and pain in the liver may be treated by blisters over that organ, and the remains of this complaint by blue pill and rhubarb. During convalescence, uneasiness in the region of the spleen, and a feeling of distension and enlargement may be opposed by the use of tartar-emetic ointment or of iodine ointment over the part. A painful and irritable state of the kidneys may be soothed by the warm bath or treated with dry cupping. The impairment of hearing and vision may be left to time.

*Remarks on the treatment.*—There are two parts of the treatment respecting which medical men may differ. One is, the degree of necessity for venesection, some being more partial to it than others. In some cases, it seems to be immediately required by the severity of the head symptoms; but after shaving the scalp and the cold affusion these become milder, and the patient's weakness is apparently so great as, to some extent, to contra-indicate it. If after shaving the scalp, blood-letting, and the use of the cold affusion, the pain be still great, venesection ought to be employed; but for slight headach, it is not required. The other probable subject of difference is the propriety of giving quinine while the pyrexia continues,[*] which cannot be avoided if there is no apyrectic period in which to give it. Lind, in his work on hot climates,[†] quotes from Clark (on long voyages) the following sentence, without comment certainly, but still without any expression of dissent. Cinchona may be given "with advantage in malignant and remittent fevers in India, not only during the remissions, but even during the exacerbations of the fever; *and when the fever is continual,*" though where there is a remission there seems to be no occasion to give it in the paroxysm; and I am inclined to think that it is best never to use cinchona, but quinine only, and to give this, if it be deemed proper to give any, in a small dose in solution at that time, during the twenty-four hours when there is least pyrexia. The only probable ill effect is a slight increase of the headach for an hour or two; but this sometimes does not occur; and when it does, the temporary inconvenience may be endured, if any permanent advantage is expected to follow. If the headach be much increased after the quinine, the medicine is to be discontinued.

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[*] This practice is found disadvantageous in the Mediterranean fever.

[†] Third edition. London, 1777, page 120.

*Cases.*—I shall now give the outlines of one or two cases to show the course of the symptoms.

At Port Colborne, Lake Erie, 1840, July 23, Mr Malcolm, R. D., aged twenty-six, royal navy; complains of great heat of skin; thirst; extreme weakness; pain in the head and limbs; tongue brown; nausea; anorexia; the pulse weak and quick. Hair to be cut short; cold affusion on the head; cold sponging of the limbs; an emetic to be followed some hours after by a cathartic.

July 24th. Slept badly; headach rather less; aversion to light and noise; the other symptoms continue, with vomiting of greenish and yellowish fluid. Purgative medicine and cold applications.

July 25th. Slept little; the same symptoms continue. He was bled to eight ounces, and syncope, with but little effect on the headach. Head to be shaved and a blister applied.

July 26th. Delirium in the night; less headach; heat of skin, and thirst continue; some pain in the left iliac region; slight cough, and pain near the middle of the sternum. To apply a blister to the chest, and to take a cough-mixture containing antimony.

July 27th. Some delirium in the night; headach somewhat less; is rather drowsy; skin hot; blister rose well; no pain of chest; less cough; still occasional pain in the left iliac region. To apply a sinapism to the part; laxative medicine.

July 28th–29th. Delirium at night; slight headach; a little cough.

July 30th. In the course of to-day his skin became pretty cool; no pain of head or chest; the cough is nearly gone. Pulse quick; feeble.

July 31st, Augt. 7th. During these eight days he had paroxysms of quotidian remittent, coming on about 11 or 12 P. M., and going off about 5 or 6 A. M. During the day time he felt cool and pretty comfortable, and took opening medicine and cinchona.

August 8th,–11th. During these four days he had two fits of tertian remittent, on the 8th and 10th.

August 12th–15th. These were four days of tertian intermittent, the paryoxysms commencing about 11 A. M. on the 12th and 14th. On the well-days he took cinchona and wine.

August 16th–22d. During these seven days there was no fever, either continued or periodic. He complained only of weakness and occasional slight cough, on account of which the wine was omitted, and he took cinchona alone.

August 3d. There is no eruption on the lips. To return to duty, having been sick thirty-one days, of which there were eight of continued fever, eight of quotidian remittent, four of tertian remittent, four of tertian intermittent, and seven days of convalescence.

*Remarks.*—This patient had been at Grand River for some weeks, and was attacked with fever a few days after arriving at Port Colborne. Besides the treatment above mentioned, there was the daily use of purgatives or laxatives, and occasionally antimony at night. He afterwards had several attacks of quotidian and tertian ague during the time he remained in Canada.

CASE II.—At Penetanguishene, Andrew B. Montgomery, aged eighteen, ship-boy, H. M. S. Experiment, was taken ill of fever on September 4, 1843.

Sept. 4th–12th. On these nine days there was constantly morbid heat of skin, with more or less of the following symptoms:—great debility; headach; intolerance of light and noise; pains in the back and limbs; thirst; anorexia; and quickness and feebleness of the pulse. On the first four days there was sleeplessness, then drowsiness; there was delirium on several nights; on one or two days, green vomiting; during the night all the symptoms were aggravated; but during the whole of the day there was considerable pyrexia. The remedies were, shaving the head, cold affusion thereon, purgative medicine daily, cold sponging the limbs, and a blister to the scalp. On September 9, pain in the left umbilical region was treated by a sinapism.

Sept. 13th. For the first time since the 4th the heat of skin is natural, and there is no thirst, headach, or drowsiness. To take a scruple of cinchona, and four grains of rhubarb twice a-day.

Sept. 14th. At 8 A. M. chilly for an hour; hot for about the same time; and then sweating for an hour and a half.

Sept. 15th. Had a paroxysm rather more severe than that of yesterday.

Sept. 16th. At 7 P. M. coldness; shaking and lumbar pain till 8½; hot till 10; and sweating till 12 P. M.

Sept. 17th–28th. During these twelve days there was no fever or return of the fits. He complained of weakness only, and took twice daily half-a-drachm of cinchona with a few grains of rhubarb, and also ten or fifteen of gunpowder latterly with the morning dose only.

Sept. 29th. The complexion is of the very pale kind often seen after ague; there is no lip-eruption. To return to duty, having been ill twenty-five days, of which there were nine of continued fever, (Sept. 4th–12th); on Sept. 13th there was no fever; then three days of quotidian ague, (Sept. 14th–16th); and twelve days, (Sept. 17th–28th) of convalescence.

*Remarks.*—During the first nine days I watched carefully to see if there was a remission, but there was pyrexia constantly during the whole of the twenty-four hours. The patient had never before been ill of malarial fever, and has since had at the same place two attacks of quotidian and one of tertian ague. Cinchona was given only because there was a deficiency of quinine; the rhubarb was added to prevent its being rejected; the gunpowder was at first given twice daily only, but afterwards, in the morning only, as its diuretic effect was inconvenient in the night.

CASE III.—At Penetanguishene, 1843, Sept. 8, Thomas Porter, aged twenty-one, seaman, H. M. S. Experiment, complains of extreme weakness; pains in the head, loins, and limbs; catarrh; great heat of skin; pulse quick and weak; anorexia; tongue foul. Hair to be cut; cold affusion on the head; cold sponging the face and limbs. To take an emetic, to be followed some hours after by calomel and jalap.

Sept. 10th. Delirium in the night; still great weakness and heat of skin; some headach. The head to be shaved, and a blister applied; to take daily laxative medicine, and to use the antimonial solution.

Sept. 11th. Catarrhal symptoms abated; less headach; is drowsy; heat of skin, thirst, and weakness continue. To have a cathartic.

Sept. 12th. Had several stools; no headach or drowsiness; heat of skin nearly natural. To take daily, cinchona, rhubarb, and gunpowder.

Sept. 13th–19th. During these seven days he had four fits of tertian ague. On the well-days, he took cinchona.

Sept. 20th–29th. For these ten days, he complained only of debility.

Sept. 30th. Complexion very pale; no lip eruption. To return to duty, having been ill twenty-two days, of which there were five of continued fever, seven of tertian ague, and ten days of convalescence.

*Remarks.*—This was the patient's first attack of malarial fever. He has since had repeated seizures of quotidian and tertian ague at the same station. The subjects of cases second and third had within the previous fortnight, visited Grand River, Port Stanley, Amherstburg, and other malarious parts, and were taken ill a few days after arriving at Penetanguishene, a place where there is never seen an instance of malarial fever among those constantly residing in it, but only in persons who have previously had the disease in other parts of Canada, or have lately been in some of the unhealthy districts.

In these two cases I made some experimental use of gunpowder. In the first, its only sensible effect was on the kidneys, and, in the other, it had for some days the effect, and then seemed to act on the bowels. It is chiefly on account of its contained charcoal that gunpowder may be occasionally useful in these* fevers, acting as a corrective to some disordered state of the stomach. The first dose or two is apt to be rejected. It is better to give it in the morning, as, when it acts diuretically, the patient is less disturbed in the night by calls to micturate.

*Different malarial fevers.*—Malarial fever includes, 1. marsh fever, and, 2. malarial fever, found where there is no marsh. The different malarial fevers of Canada, as far at least as I have observed them, may be arranged in the following manner.

MALARIAL FEVERS OF CANADA.

Family i.—Malarial continued fever.
*a.* Mild. *b.* Severe.
Family ii.—Malarial remittent fever.
1. Quotidian remittent. } Variety, Bilious remittent.
2. Tertian remittent.
Family iii.—Intermittent fever.
1. Quotidian intermittent.† } Varieties, *a.* Asthmatic ague.
2. Tertian intermittent. *b.* Incomplete ague.
3. Quartan intermittent. *c.* Irregular ague.
Family iv.—Monoparoxysmal ague, or ague consisting of one fit only.

Quartans I have found very rare. Asthmatic ague is noticed in the Edin. Med. and Surg. Journal, October 1843, p. 367. Incomplete ague is what is popularly and absurdly called "*dumb ague.*" In it, the fits are deficient in one or two of their three stages, and pretty regular in their accession. In irregular ague, the paroxysms are complete in their parts, and variable in their accession. When a case of ague is treated with quinine before there is time for a second fit, and when none such occurs, it may be regarded as an instance of checked quotidian or tertian; but if, without medicinal interference, there be no second fit, the case cannot with perfect correctness be called intermittent; and such cases sometimes occur, though perhaps they are too unimportant to form a separate family, and might, if not with equal correctness, still with more simplicity, be ranged with cases of irregular ague.

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* See Dr Craigie's Practice of Physic, i. 137, and Dr Dick, in Edin. Med. and Surg. Journal, January 1838. The usefulness of gunpowder, (on account of its nitre), in an important disease, is ably shown in Dr A. Henderson's paper on Scurvy in the same Journal for July 1839, and any medicinal qualities it possesses cannot be too well remembered, as in military and naval practice it is always to be obtained when medicines cannot be procured.

† Edin. Med. and Surg. Journal, April 1844, page 392.

### *Considerations on the nature of malarial continued fever.*

In treating cases of this disease I have carefully watched their course to see if any remission could be observed; and I satisfied myself that during the twenty-four hours, and for seven or eight successive days, the pyrexia continued without any change, except that the morbid heat of skin and other symptoms were more severe at one time than another. It therefore seemed correct to call it a continued fever, though one cannot be equally positive as to the correctness of prefixing the term malarial to the name of the fever; as that implies the presence and operation of a specific cause. This, however, I was led to do for various reasons, and chiefly from observing the tendency of many of the cases to pass into remittent, in the same way as remittent, which is allowed to be a malarial fever, often passes* into intermittent. Several objections† may be made to the proposed theory of this disease. It may be said, 1st, that those cases of malarial continued fever which do not pass into remittent or ague are merely cases of common continued fever or of typhus; 2d, that those cases of it which do pass into remittent or intermittent are only cases of these diseases respectively, and that the febrile state dwelt on in this paper is only their stage of invasion. But to this it may be replied, that a remittent cannot well have more than two or three days' preliminary symptoms of a serious nature, and when these last for eight or ten days, there seems to be no propriety in giving them a name which certainly does not describe their character; and as for intermittent, its first stage often comes on with only a few minutes' warning; at other times a person for two days before feels uncomfortable, but still able to go about his usual employments; so that its commencement and course are different from an instance of pyrexia continued for ten days, and then passing through two fits of tertian before recovery.‡

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* On the transition from one form to another, see Dr Copland's Dict. Medicine, i. page 936.

† On the classification of fevers, see Dr Craigie's Pract. Physic, vol. i. page 33.

‡ In Sir William Burnett's account of the Mediterranean fever, (1816,) it is mentioned that occasionally some cases of it passed into remittent and others into intermittent, (pp. 225, 254, 478, 485.) Yellow fever assumes variously the continued and remittent types, and at times becomes intermittent. The Bulam fever is described by Sir William Pym as a continued, and by Dr Gillespie as a remittent fever. These three diseases may be considered non-contagious malarial fevers, having sometimes a continued and at other times a periodic character; yellow fever, like the others, arising from malaria, and having also an additional cause in some unknown state of the atmosphere. The mass of controversial writing on the nature of these fevers is analyzed with great perspicuity in Sir George Ballingall's Military Surgery, 1838, page 486, *et seq.*

Malarial continued fever is one of the kinds of that disease popularly called in Western Canada lake-fever,* which name is also given to remittent, and likewise, though more rarely, to intermittent.

Having, where this paper is written, but little access to books, I am unable to refer to the works of Fergusson, Johnson, Wilson, Macwilliam, and others who have written on malarial diseases. I have endeavoured to state facts separately from hypotheses; and, in conclusion, I may remark, that since 1841 I have held these views respecting this kind of lake-fever; and for these four years have waited to see if, by further observation, they might be altered or rectified. They are now offered for the consideration and judgment of the profession, to be amended, if necessary, by other observers.

*Penetanguishene, Lake Huron,*
*March* 1845.

## ART. V.—*A Concise View of the Progress of Military Medical Literature in this Country; being a Chronological Arrangement of Authors, with Critical Remarks on their Works.* By JAMES IRVING, M. D. (Continued from Vol. lxiii. p. 302.)

1782. A Treatise on the Venereal Disease. By George Renny. London, 8vo.

This work is the production of the present Director-General of the Army Medical Department for Ireland, and was published while the author was surgeon to the Athole Highlanders. Dr Renny entered the army as assistant surgeon in June 1775, was appointed surgeon in January 1780, and Director-General for Ireland in June 1795. His remarks on syphilis are evidently the result of a thorough practical knowledge and extensive experience of the disease in one of the best fields for its study. It is well known that at this time, and even considerably later, mercury was believed to be a specific; and, without its use, practitioners imagined that no case of true venereal disease was ever cured. To Dr Renny mercury still proved a difficulty, and he does not seem to have been able to divest himself of all the notions which necessarily forced themselves upon the minds of those who had been taught to take so exclusive a view of the treatment of the disorder. We now know that patients with this disease recover without mercury. Dr Renny was not then altogether prepared to make such an admission; but he administered the remedy cautiously—narrowly watching its effects—and more with the object of obtaining its alterative and diaphoretic than its sialogogue action; and in fact he highly disapproved of the practice of violent salivations, then so much in vogue.

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* In the Edinb. Med. and Surg. Journ. vol. lv. p. 348, I gave a too restricted meaning to this word, which, besides including remittent, and sometimes ague, is also applied to cases where the type is continued.

*Reviewed.*—Monthly Review, vol. lxviii. p. 454.

1782. A Treatise on the Synochus Atrabiliosa, a contagious Fever which raged at Senegal in the year 1778, and proved fatal to the greatest part of the Europeans, and to a number of the natives, &c. Concluding with an argument concerning the bad consequences which must attend the present mode of sending Convicts to Africa as Soldiers. By J. P. Schotte, M. D. London, 8vo.

*Reviewed.*—Monthly Review, vol. lxix. p. 152.

1783. Observations on the Means of preserving and restoring Health in the West Indies. By John Rollo, M. D. London, 12mo.

To officers of the army serving in the West Indies, these observations are addressed, with a view of indicating the proper means of preserving their own, and the health of the soldiers under their command. The reason of his again bringing this subject under the notice of military officers will be found in the following quotation. "To me it is scarce a matter of doubt whether the officer is not more concerned in the prevention of sickness among the soldiers than the surgeon." His remarks on this very important subject embrace a variety of topics connected with the climate of the West Indies, heat, night-air, rain, with hints on the situation of barracks, on dress, diet, and the employment of troops.

*Reviewed.*—Monthly Rev. vol. lxviii. p. 361.

1783. Observations on Hepatic Diseases incidental to Europeans in the East Indies. By Stephen Matthews, Surgeon, H. E. I. C. S. London, 8vo.

*Reviewed.*—Monthly Review, vol. lxx. p. 387.

1784. A Treatise on the Influence of the Moon in Fevers. By Francis Balfour, M. D. Calcutta, 8vo.

*Editions.*—Calcutta, 1784, 8vo. Edinburgh, 1785, 8vo. Reprinted in his Collection of Treatises on Sol-Lunar Influence, and in Duncan's Med. Comment. Decade I. vol. ix. p. 147.

1786. Observations on the Acute Dysentery, with the design of illustrating its causes and treatment. By John Rollo, M. D. Sur.-Gen. R. Art. London, 8vo.

*Reviewed.*—Monthly Review, vol. lxxv. p. 155. Critical Review, vol. lxi. p. 341.

1787. Essays on the Hepatitis and Spasmodic Affections of India; founded on observations made whilst serving with His Majesty's Troops in different parts of that country. By Thomas Girdlestone, M. D. London, 8vo.

Here we are presented with a history of hepatitis as it occurred among several hundreds of officers and men in the Carnatic and Tanjore countries during and after a campaign of twenty-two months. Under the title of the Spasmodic Affection of India, he describes the disease now known as Spasmodic or Asiatic Cholera. He does not even mention the word *cholera,* but has given a graphic sketch of the disease as it raged epidemically at Madras in 1782. We are told that the attack was in general very sudden, and that in some cases a fatal termination occurred in the course of an hour. It was unanimously judged at a meeting of the faculty at Madras, that the disease proceeded from "damps from the earth, the not using of capsicum, bad arrack, and a coffee made of stramonium."

*Reviewed.*—Monthly Review, vol. lxxix. p. 181.

1787. The Duties of the Regimental Surgeon considered; with observations on his general qualifications, and hints relative to a more respectable practice, and better regulation of that department; wherein are interspersed many medical anecdotes, and subjects discussed, equally interesting to every practitioner. By Robert Hamilton, M.D. London, 2 vols. 8vo.

Dr Hamilton served for a few years in the army, and after his retirement published the above work, which is intended to be a guide to Regimental surgeons. The whole scope of the work is excellent, as it inculcates the necessity of army medical officers being well educated, and of their paying the most minute attention to all professional duties, and contains hints as to their general conduct. A variety of topics is discussed in separate chapters, such as—the difficulties with which the regimental surgeon has to contend—his qualifications—study, and the selection of a library—medical registers—punishments—the utility of experiments—the situation of surgeon's mate, &c. He is the first medical writer who takes notice of the flogging of soldiers, in so far as the surgeon is concerned; and in his chapter on this subject some instructive cases and just remarks are to be found. A medical officer, superintending a punishment, finds himself in a very peculiar situation. Responsible to a civil court for the man's life if the punishment is carried too far; subject, it may be, to the censure of the commanding officer if he reports that the prisoner can endure no more flogging—which, however, a humane man will only do when he sees that the offender can bear it with safety no longer, since, after his recovery, he must undergo the rest of his sentence; a surgeon finds himself called to "superintend a punishment," having no official instructions to guide him, and finding very little in books to direct him in this most unpleasant duty. Hence Dr Hamilton's observations are important, and contain some information as to the amount of punishment which a man may endure under various circumstances,—the symptoms indicative that he can bear no more, and as to the general behaviour of the medical officer on such occasions. Here it may not be improper to remark, that the earliest medical writer on corporal punishments disapproves of them.*

From the time of Dr Hamilton we find no mention of the subject of military punishments by army medical officers, except mere incidental allusions, till Mr Marshall, than whom no one could be better qualified for the task, published, in fifteen numbers of the United Service Journal for 1843 and 1844, " A Historical Sketch of Military Punishments in as far as regards non-commissioned officers and private soldiers." The author's object is to describe the various punishments employed in the British army, to point out the ameliorations that have taken place, and to intersperse " cursory remarks on the evils which result from an abuse of the penalties of military law and military usages, leaving the means of preventing these evils to the consideration of those in authority, whose duty it is to superintend the recruiting, the discipline, and the general welfare of the State." Considering the interest excited by this contribution, both on account of the subject itself, and the able manner in which it is here discussed, it is to be hoped that Mr Marshall may be induced to publish the Historical Sketch in a more convenient and more accessible form.

*Editions.*—London, 1787, 2 vols. 8vo. 1794, 2 vols. 8vo.

*Reviewed.*—Critical Review, vol. lxvi. p. 369. Monthly Review, vol. lxxxi. p. 168. British Critic, vol. ii. p. 389; vol iii. p. 43.

1787. A Treatise on Tropical Diseases, on Military Operations, and on the Climate of the West Indies. By Benjamin Moseley, M. D. London, 8vo.

The first part of this work consists of desultory remarks on the climate and natural history of the West Indies, and on the preservation of health during the voyage, and after arrival in those islands. The second part gives a rambling history of the military operations in the West Indies, in connection with the health of the troops; with observations on the prevailing diseases,—such as dysentery. yellow fever, tetanus, *colica Pictonum.* He has here reprinted his observations on dysentery, and in addition to the matter contained in that publication, enters more fully into his plan of treatment, and likewise gives a sketch of the opinions of ancient and modern authors respecting this disease. The whole tenor of his practice, which is bold and decisive, evinces great confidence in the power of medicine and little faith in the efforts of nature. He must evidently have been a man of considerable reading and observation, but the style of his writings is rambling and unconnected.

*Editions.*—Lond. 1787, 8vo. 1788, 8vo. 1795, 8vo. 1803, 8vo.

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* " I wish after all, (says Dr Hamilton), that the military laws knew no such thing as flogging; and that in place thereof some other mode of punishment could be devised less ignominious. On this head, however, I dare say nothing; it is out of my line of life, though I wish it with all my soul abolished as an inhuman thing, more fitting the nature of savages than civilised and polished nations." (Vol. ii. p. 87.)

*Reviewed.*—Critical Review, vol. lxv. p. 101. Monthly Review, vol. lxxviii. p. 472.

1788. Observations on the Diseases of the Army in Jamaica; and on the best Means of Preserving the Health of Europeans in that Climate. By John Hunter, M. D. London, 8vo.

Dr Hunter gives the result of observations made while he had the superintendence of the military hospitals in Jamaica, from the beginning of 1781 to May 1783. The introductory portion contains remarks on the topics usually first discussed in works of a similar nature, referring to the management of troops during the voyage and on their arrival in the West Indies—the topography of Jamaica—the causes of disease among soldiers—and the means for securing the health of strangers. He also gives a short review of the losses sustained by regiments stationed in Jamaica, with some account of the relative healthiness of different quarters of the island; and next considers the history and treatment of the diseases most prevalent among the troops. He was among the first to direct attention to the cause of a form of colic, closely resembling the *colica Pictonum*, by which many men were annually lost to the service; and he has shown that this disease owed its origin to lead introduced into the system by means of rum, which had been impregnated with the metal, in passing through a leaden worm during distillation.* His experience coincides with the result of more extensive and later observation, as to the small number of venereal cases in the West Indies. The last chapter treats of the best means of taking care of the sick of armies in the West Indies. In speaking of hospitals, he points out the advantages of keeping regular reports and returns of the cases under treatment. Such a plan had been carried out in the hospitals under his superintendence, and he recommends its general adoption both in the army and navy, and also suggests that these documents should be transmitted to the heads of the departments.

*Reviewed.*—Duncan's Med. Com. vol. xiii. p. 104. Monthly Review, vol. lxxx. p. 288. Analytical Review, vol. xxv. p. 26.

1790. A Treatise on Putrid Intestinal Remitting Fevers, in which the laws of the febrile state and sol-lunar influence being investigated and defined, are applied to explain the nature of the various forms, crises, and other phenomena of those fevers; and thence is deduced and instituted an improved method of curing them. By Francis Balfour, M. D. Edinburgh, 8vo.

*Editions.*—Edin. 1790, 8vo. 1795, 8vo. Reprinted in his Collection of Treatises.

*Reviewed.*—Duncan's Med. Comment. vol. xv. p. 261.

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* His views on this subject are more fully stated in two papers in the second and third volumes of the Medical Transactions.

1791. A Treatise on the Action of Sol-Lunar Influence, in which it is inferred, from observations made on the Urine, &c. that it occasions the daily and lunar revolutions observable in the state of Fevers, of other diseases, and of health, by procuring coincident changes in the condition of the constrictive power, and balance of the vascular system; and that there is reason to believe that sol-lunar influence exerts its dominion over every production and revolution in nature. By Francis Balfour, M. D. Edinburgh, 8vo.

*Editions.*—This was, in 1792, joined with his "Treatise on Putrid Intestinal Remittent Fever," and published under the title of "A Treatise on Sol-Lunar Influence." Reprinted in his Collection of Treatises.

1791. Select Evidence of a Successful Method of Treating Fever and Dysentery in Bengal. By John P. Wade, M.D. London, 8vo.

Dr Wade belonged to the Hon. East India Company's service. His "Select Evidence" consists of histories of 119 cases of fever, and 45 cases of dysentery, which occurred at Benares, and are related without comment, being intended to afford a body of evidence for the determination of some important practical questions.

*Reviewed.*—Critical Review, vol. v. p. 210.

1791. An Inquiry into the Causes which produce, and Means of preventing Diseases among British Officers, Soldiers, and others in the West Indies. Containing observations on the mode of action of Spirituous Liquors on the human body; on the use of Malt Liquor, and on Salted Provisions; with remarks on the proper means of preserving them. Also notes relating to some particulars in the British Army in Ireland and the West Indies. By John Bell, M. D. London, 8vo.

The above powerfully-written little work was published after Dr Bell had retired from the army, but contains observations suggested by his service in the West Indies as a regimental surgeon. Much of the sickness so prevalent among the troops at this time he attributes to the constant use of salt provisions as rations, and the abuse of spirituous liquors, and shows that such diet was improper for troops in that climate. He reprobates the practice of giving to sick soldiers a daily allowance of rum, and points out its many evil consequences. He therefore recommends a change of diet, and the substitution of malt instead of spirituous liquors.* He also proposes the institution of breakfast-messes among the men; and the result of subsequent experience has proved that he was correct in assigning this as an important means for preserving health in the army and navy.* In his remarks on the means of preserving health in the West Indies, he points out the impolicy of sending out newly raised regiments, at a period when the troops are subjected to much fatigue.

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* The substitution of malt liquors for spirits has apparently proved of great advantage in checking intemperance, and thereby diminishing punishment among Her Majesty's troops serving in India. The plan received a fair trial in the 26th regiment, and the surgeon, Dr W. Bell, has given a very favourable report of its result in Corbyn's Medical and Physical Journal. See also Madras Quarterly Medi.. Journal, vol. i. p. 82.

*Reviewed.*—Analytical Review, vol. xi. p. 61.

1791. A Treatise on the Fevers of Jamaica; with some observations on the Intermittent Fevers of America. With an appendix containing some hints on the means of preserving the Health of Soldiers in hot climates. By Robert Jackson, M. D. London, 8vo.

Here it has been deemed unnecessary to insert any notice of the life and services of Dr Jackson, since a short biographical sketch of him is given in a former number of this Journal, (vol. xxix. p. 110.) It was an invariable practice of this distinguished physician to keep notes of any observations suggested by his attendance on the sick; and thus we account for the accuracy of clinical description that characterises this as well as all his other practical works. Entering the army, as he confesses to have done, with only a general knowledge of practice, he observed with care, and with becoming candour did not hesitate to compare his own observations with those of others. The above work contains the result of experience gained between the years 1774 and 1778, when serving with the 60th regiment in Jamaica; and between 1778 and 1782, when he was surgeon to the 71st regiment in America. Regarding the fevers of those countries, he professes to impart only such information as was not generally known to European practitioners; but from the small number of books to which he had access when abroad, he has occasionally brought forward as new, facts and practices before understood or followed. The appendix consists of remarks on the means of preserving the health of troops in hot climates, with strictures on the medical department of the army, and hints for its better constitution.

*Reviewed.*—Critical Review, vol. iii. p. 140. Analytical Review, vol. xi. p. 144.

1793. A View of the Diseases of the Army in Great Britain, America, the West Indies, and on board of King's Ships and Transports, from the beginning of the late war to the present time. Together with Monthly and Annual Returns of the Sick, and some account of the method in which they were treated in the 29th Regiment, and the third battalion of the 60th Regiment. By Thomas Dickson Reide. London, 8vo.

The above publication is divided into two parts; the first referring to the diseases of the 29th regiment in America from February 1776 to December 1787, and the second part relating to the third battalion of the 60th regiment, from May 1778 to September 1791, while serving in Great Britain and the West Indies. The general arrangement of both parts is similar: he first gives a journal of the movements and diseases of the corps, after which follow short notes on the history and cure of the disorders most prevalent; and, in conclusion, returns of the sickness, mortality, and invaliding. It may be remarked that he entertained peculiar views as to the pathology of several diseases, and endeavours to refer all cases of fever to one genus, namely, the remittent; supporting this opinion by quotations from the writings of ancient and modern physicians.*

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* See Ballingall's Military Surgery, 3d edition, p. 38.

Although returns of the sick of an army were occasionally made to the General, this work contains the first mention to be found of their being transmitted to the head of the medical department.† Mr Reide states that on his arrival in the West Indies, he received from Sir C. Wintringham, physician-general, and Mr Adair, surgeon-general, orders directing regimental surgeons "to send home a return of the sick every half year, with such remarks and observations as they might make on the diseases and methods of cure." Returns and Tables of sickness in the 29th and 60th regiments occupy a considerable portion of the work; and he also gives directions for framing them, with forms of returns.

*Reviewed.*—Monthly Review, vol. xii. p. 90.

1793. Nature and Effects of Emetics, Purgatives, Mercurials, and Low Diet, in Disorders of Bengal and similar latitudes. By J. P. Wade, M. D. London, 8vo.

This publication by Dr Wade, like his "Select Evidences," consists almost entirely of a collection of cases illustrative of his peculiar views in regard to the treatment of tropical diseases.

*Reviewed.*—Critical Review, vol. vii. p. 233.

1793. A Paper on the Prevention and Treatment of the Disorders of Seamen and Soldiers in Bengal. Presented to the Honourable Court of East India Directors in the year 1791. By John Peter Wade, M. D. London, 8vo.

Dr Wade seems to have formed his opinions from a diligent observation of facts, and consequently his views though singular are entitled to attention. As preventive of disease in India, he recommends the employment of occasional laxatives; while in the cure of fever, dysentery, and liver complaint, he discards most of the remedies commonly used, and treats such cases by means of emetics and purgatives.

*Reviewed.*—Duncan's Med. Comment. vol. xviii. p. 200. Critical Review, vol. viii. p. 369.

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* Thus he speaks of inflammatory fever as a remittent attended with accidental symptoms, mistaken for inflammatory; so also he speaks of influenza as being a remittent complicated with catarrhal symptoms; thus also he reckons small-pox, dysentery, &c. as fevers of the same type. Hence in their treatment his principal remedy was bark.

† It is here stated that Dr Millar was the "inventor of medical returns, and that, while his pupil at the Westminster Dispensary, Mr Reide had become acquainted with the mode of framing them."

1794. A Treatise on Sol-Lunar Influence in Fevers. By Francis Balfour, M. D. Calcutta, 8vo.

*Editions.*—Cal. 1794, 8vo. Lond. 1795, 8vo. Reprinted in his Collection of Treatises.

1794. A Treatise on the Blood, Inflammation, and Gunshot Wounds. By the late John Hunter. To which is prefixed a Life of the Author, by Everard Home. London, 4to.

In order to show Mr Hunter's opportunities for the study of gunshot wounds, it may be necessary to give a brief enumeration of his services. In the year 1759 he was appointed a staff-surgeon in the army on the continent; and he was present at the siege of Belleisle. In 1762 he again accompanied the troops employed in the war with Spain; and in 1786 he became surgeon-general to the army in succession to Mr Middleton. On the death of Mr Adair in 1792, he received the additional appointment of inspector-general of hospitals. On the subject of the blood and inflammation he advances many original opinions, and exhibits many striking views of the animal economy, so that this is usually considered as his principal work, and that on which his fame as a physiologist mainly depends. In reference to the treatment of gunshot wounds, he has the merit of having exploded the practice of indiscriminate dilatation, and of having shown that, as a general rule, it was inadmissible. He was a decided advocate for delayed amputation, and brings forward many arguments in its favour. This question, however, may be said to have been settled by the experience of the surgeons employed during the last war, who gave the preference to immediate amputation.

*Editions.*—Lond. 1794, 4to. 1812, 2 vols. 8vo. 1818, 2 vols. 8vo. 1828, 8vo. In the collective edition of Hunter's Works, by J. F. Palmer, Lond. 1835, 4 vols. 8vo, with a 4to volume of Plates.

*Reviewed.*—Critical Review, vol. xiii. p. 249 and 424.

1794. An Inquiry into the Abuses of the Medical Department in the Militia of Great Britain, with some necessary Amendments proposed. Addressed to the President and Members of the Militia Club. By H. Moises. London, 8vo.

Much of the matter contained in this pamphlet appears to have been taken from Dr Hamilton's Observations on the Duties of the Regimental Surgeon. The principal subjects of inquiry are, 1. The qualifications of surgeons. 2. Mates unnecessary in the militia. 3. Supply of medicines, &c. for the sick. 4. Pluralities highly improper in the medical department. 5. The difficulties in the way of regimental surgeons, on account of want of rank, the caprice of authority, &c. On each of these heads he makes some remarks, points out different alleged abuses, and proposes means for their removal.

*Reviewed.*—Analytical Review, vol. xxii. p. 408.

1795. An Essay on the Malignant Pestilential Fever introduced into the West Indian Islands from Boullam on the coast of Guinea, as it appeared in 1793 and 1794. By Colin Chisholm, M. D. London.

In an introduction of considerable extent, we find an account of the topography and diseases of the island of Grenada, with remarks on the state of the weather for each month during the years 1784, 1785 and 1786, and 1793. Dr Chisholm next describes the "Malignant Pestilential Fever." He denies that this is the same disease as yellow fever, and asserts that it was altogether unknown in the West Indies till the year 1793, when it was introduced by the ship Haukey, which had come from Boullam on the west coast of Africa. He gives a minute detail of the progress of the disease in order to prove, "*1st*, that it was uncommonly infectious; *2d*, that it arose from human contagion, heightened by various causes, to a pestilential degree of violence; *3d*, that, like the plague, it has been communicated in every instance, either by actual contact with an infected person, or by breathing air charged with effluvia perspired or discharged from the lungs of an infected person, or by touching the clothes of, or sleeping in a place where an infected person has been." After some observations on the modes of preventing the disease, the essay is concluded by histories of fifteen cases.

*Editions.*—London, 1795, 8vo. London, 1801, 2 vols. 8vo.
*Reviewed*—Analytical Review, vol. xxii. p. 13.

1796. Observations tending to show the Mismanagement of the Medical Department in the Army; with a view to trace the evils to their source, and to point out to Government the necessity of attending more to the health of the soldiers in time of war. To which is annexed a Representation of the System adopted in the Hanoverian Service. By N. Sinnot, M. D. London, 8vo.

From the nature of this pamphlet, from the peculiarity of the surname, and the applicability of the caution which it conveys to the subject discussed, some have imagined that the author wrote under a fictitious name. The supposition is, however, without foundation, for, in a list of the medical graduates of the University of Edinburgh, we find the name of Nicholas Sinnot, *Hibernus*, as taking his degree in 1793.

In this spirited pamphlet he relates what fell under his observation on the continent, and certainly gives a sad picture of the manner in which the sick were treated in general hospitals in the year 1794. Believing that the mismanagement originated with those who had the direction of hospitals, he takes a view of the medical staff, and points out many inconsistencies, which fortunately do not now exist. In concluding his observations he adds, "Under such circumstances, how is it possible for hospitals to be well conducted? The physician appointed without a day's service in the army, consequently without any knowledge of military hospitals, or the least experience in army medical practice; the regimental surgeon appointed apothecary, to be dignified with the office of physician; a medical man appointed purveyor without any regard to the necessary qualifications; and the hospital mate obliged to act in every department, though he never gave any other proof of his knowledge than having answered a few queries on anatomy and surgery." As a better system, he therefore proposes the adoption of that followed in the Hanoverian service, of which, in conclusion, he gives a slight sketch.

*Reviewed.*—Monthly Review, vol. xix. p. 348. Critical Review, vol. xvi. p. 116.

1795. A Letter to Officers of the Army under orders, or that may hereafter be sent to the West Indies, on the Means of preserving Health, and preventing that fatal disease the Yellow Fever. By Stewart Henderson, M. D. London.

*Reviewed.*—British Critic, vol. vi. p. 553.

1796. Memoir on the Medical Arrangements necessary to be observed in Camps; the Means of rendering the Clothing of Soldiers proof against Moisture; of promoting Cleanliness and Regularity; and of preventing the Introduction or Spreading of Infectious Diseases. Respectfully submitted to the consideration of H. R. H. the Duke of York. By Robert Somerville. London, 8vo.

The introductory portion of this work contains "Hints respecting the state of the camp at Aberdeen in 1795, with some observations on encampments in general; and an Appendix on the ancient dress of Scottish Highlanders, by Sir John Sinclair, Colonel of the Rothsay and Caithness Fencibles;" to the first battalion of which regiment Mr Somerville was surgeon. In the "Memoir" a variety of topics are discussed in reference to the means of preserving the health of troops in camp; the clothing of soldiers; their food; the means for promoting cleanliness in camps and hospitals, and the prevention of infectious diseases. He regards damp as the chief cause of sickness among soldiers encamped in this country, and therefore suggests different plans for preserving the tents free from moisture, and of rendering their clothing waterproof.

*Reviewed.*—Analytical Review, vol. xxv. p. 30.

1797. Practical Observations on the Treatment of Ulcers on the Legs, considered as a branch of Military Surgery. By Everard Home. London, 8vo.

Sir Everard Home was born in the year 1756. He served for a short time as a regimental surgeon; and in 1821 was appointed surgeon to Chelsea Hospital, where he continued to reside till the time of his death, on the 31st of August 1832. The number of men annually discharged from the service at this time, on account of ulcers of the lower extremities, was very great. Abroad, and especially in the West Indies, such complaints proved the most troublesome surgical cases which it fell to the lot of the army medical officer to treat;—many men were every year sent home to the general hospitals—others had their limbs amputated—and not a few lost their lives. According to Sir E. Home, all ulcers were at this period treated in the same manner. If in a foul state, poultices were used till the sore assumed a healthy aspect, when it was dressed;—"the same kind of poultices is used to all foul ulcers, and the same kind of dressing is used to all those which put on a more favourable appearance." The object of this work, therefore, was to afford juster views of the pathology of ulcers, and to establish some general principles for the guidance of practice in such cases.

*Reviewed.*—Critical Review, vol. xxi. p. 266.

1797. An Inquiry into the Nature and Causes of the great Mortality among the Troops at St Domingo; with practical remarks on the Fever of that island; and directions for the conduct of Europeans on their first arrival in warm climates. By Hector M'Lean. London, 8vo.

Dr M'Lean was assistant inspector-general of hospitals for St Domingo. The first part of his work embraces a great variety of miscellaneous subjects, referring to sundry topics connected with pathology, the doctrine of fever, and the causes and treatment of tropical diseases. He says that young soldiers should not be sent to the West Indies, being more liable to fever, and because the "chance of living in a warm climate increases as we advance from thirty-five to fifty."* In reference to the yellow fever, he thinks that it is a non-contagious disease—that the yellowness which characterizes it is owing not to bile circulating in the blood, but to some alteration in the serum—and that the yellow fever of St Domingo was not a new or peculiar disease, but simply the endemic remittent applied to the European constitution. Regarding, therefore, the inflammatory diathesis as the predisposing cause, he advises that soldiers, during the voyage, should be kept on short allowance, and should have no stimulating liquors. He alludes to a scheme for habituating British soldiers to do duty in the heat of the day;

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* Extended experience has shown that this, though formerly a common, is an erroneous notion. "Although," (says Mr Marshall) "young lads are unfit to surmount the fatigue of warlike operations and long marches so well as full-grown men, it has been satisfactorily ascertained that, in time of peace, and when they are not exposed to much physical exertion, the ratio of mortality is invariably lower among young than old soldiers. *This result obtains in all climates where British troops are employed;* and it would appear that the mortality rises in nearly an exact ratio with the age of individuals." On Enlisting, Discharging, and Pensioning of Soldiers, 2d edition, p. 14. See also the table illustrative of this point at p. 58.

and another for inuring them to unhealthy stations in the West Indies. He also adverts to the salubrity of different military posts in St Domingo; to the means of preserving the health of newly-arrived troops; to miltary hospitals; and to certain anomalies in the constitution of the Army Medical Department of that time.

*Reviewed.*—Monthly Review, vol. xxix. p. 455. Annals of Med. vol. ii. p. 184.

1798. An Outline of the History and Cure of Fever, Epidemic and Contagious; more especially of Jails, Ships, and Hospitals, &c., and the Yellow Fever. With observations on Military Discipline and Economy, and a Scheme of Medical Arrangement for Armies. By Robert Jackson, M. D. Edinburgh, 8vo.

This volume contains the result of further investigations into the subject of fever, which were made while the author was surgeon to the 3d regiment or Buffs in Flanders, and while principal medical officer for St Domingo. This more extended experience has given him an opportunity of confirming many of the opinions expressed in his former publication, while in other cases he confesses himself to have been in error. In addition to what relates to fever, the work contains some short notes on the health of the troops in Flanders, and on the topography and diseases of the troops in St Domingo.

*Editions.*—Edin. 1798, 8vo. 1808, 8vo. The second edition also contains "A Refutation of the Strictures of the late Dr Currie on that part of the work which relates to the Affusion of Cold Water on the Surface."

*Reviewed.*—Critical Review, vol. xxx. p. 395. British Critic, vol. xv. p. 10.

1798. A Few Facts and Observations on the Yellow Fever of the West Indies, by which it is shown that there have existed two species of fever in the West Indian Islands for several years past, indiscriminately called yellow fever, but which have proceeded from very different causes; with the success attending the method of cure. By James Anderson. Edinburgh, 8vo.

*Reviewed.*—Annals of Medicine, vol. v. p. 38.

1798. Hints on the Ventilation of Army Hospitals and Barrack-rooms; also Observations on Regimental Practice; on Matrimony as it regards the private soldier; and on Regimental Education. By W. H. Williams. London, 8vo.

The author was surgeon to the East Norfolk Militia, and seems to have paid considerable attention to the subjects of which he treats. His observations are given in a series of letters, the first of which is on ventilation; and, after pointing out the inefficiency of the methods usually employed, he proposes a plan of his own for securing this desirable object.

*Reviewed.*—British Critic, vol. xiv. p. 192.

1799. Practical Observations on the Diseases of the Army in Jamaica, as they occurred between the years 1792 and 1797; on the Situation, Climate, and Diseases of that Island; and on the most probable means of Lessening Mortality among the Troops and among Europeans in tropical climates. By William Lempriere. London, 2 vols. 8vo.

In these volumes Mr Lempriere gives the result of eleven years' experience in the army in warm climates, in six years of which he served in the West Indies. Five leading subjects are brought under consideration: 1. A general account of the climate and diseases of Jamaica, and the relative degrees of health enjoyed by different classes of the inhabitants. 2. A description of the military posts, and the local sources of disease peculiar to each. 3. On the health of several regiments stationed in Jamaica. 4. On the more common diseases of that island. 5. On the duties of regimental surgeons in the West Indies. He gives a concentrated view of the most valuable observations of former writers in reference to the diseases of the West Indies, with such as he had himself made during his service in that climate. In the case of all diseases, but more especially those of the tropics, it is more useful to point out the means of prevention than the method of cure; hence, while he fully discusses the history and treatment of disease, he directs particular attention to the prophylactic measures necessary to secure the health of newly-arrived troops. His remarks on this subject are submitted to the consideration of the Duke of York, to whom the book is dedicated. In proof of what may be done in order to prevent disease among soldiers in the West Indies, he gives a short account of the 13th regiment, as furnishing a notable example of the advantages of superior discipline and interior arrangement. Several tables are added, showing the rate of mortality in different corps, and in different parishes, as also the result of different modes of treatment.

*Reviewed.*—British Critic, vol. xiv. p. 663.

1801. An Essay on the Malignant Pestilential Fever introduced into the West Indian Islands from Boulam, on the coast of Guinea, as it appeared in 1793, 1794, 1795, and 1796. Interspersed with observations and facts, tending to prove that the Epidemic existing at Philadelphia, New York, &c., was the same fever introduced by infection imported from the West India Islands; and illustrated by evidences founded on the state of those Islands and the information of the most eminent practitioners residing on them. By C. Chisholm, M. D. London, 2 vols. 8vo.

This is a second and very greatly enlarged edition of a book published in 1795; and after five years' additional experience in a wide range of practice, Dr Chisholm had seen nothing in the history or treatment of the disease which might induce him to alter his views.

*Reviewed.*—British Critic, vol. xvii. p. 371.

1801. Observations on the Nature and Cure of Fevers, and of Diseases of the West and East Indies, and of America; with an Account of Dissections performed in these climates, and general Remarks on Diseases of the Army. By Thomas Clark. Edinburgh, 8vo.

This work is interesting on account of the object of its publication. In 1798 Dr Ewart, as physician to H. M. forces in India and Ceylon, issued orders, directing all surgeons to keep medical case-books, which were to be transmitted at stated periods for his inspection. Shortly after the receipt of Mr Clark's, Dr Ewart sent him "a long dissertation," in which he reprobated his practice, "and even went so far as to assert that one of the patients must have been actually poisoned by the medicines he received, and he required that the mode of practice should be entirely altered." In consequence of the order having been generally disregarded by all the surgeons in India, a case-book was no longer sent from the 19th regiment, of which Mr Clark was surgeon; but on this coming to the ears of Dr Ewart, he was put under arrest for disobedience of orders, and after being a prisoner for three months, was released without a trial. His health, however, had become so impaired in consequence of this unhappy suspense, that he was compelled to come to England on a half-pay of two shillings a-day, but was not allowed to sell his commission, which he had bought. He was therefore induced to publish this book, with the view of vindicating his own reputation as a medical practitioner, against an attack which had proved "highly injurious to his health and fortune." He has several peculiar theories as to the nature of fever and other diseases, but his monthly abstract of the sick would show that his practice had been by no means unsuccessful.

1801. A short Account of the Royal Artillery Hospital at Woolwich; with some Observations on the Management of Artillery Soldiers respecting the Preservation of their Health. By John Rollo, M. D. London, 12mo.

This pamphlet had been drawn up soon after the introduction of many changes into the ordnance medical department, by Dr Rollo, after his appointment as Surgeon-General of Ordnance in 1794. From instructions which are here published, it appears that in the course of that year he had called for stated returns of various descriptions, which were regularly transmitted to the board, and to the surgeon-general of ordnance.

*Reviewed.*—British Critic, vol. xvii. p. 651.

(*To be continued.*)

## ART. VI.—*Inquiry into the probable Cause of the continued Prevalence and Fatality of Small-Pox.* By JAMES STARK, M.D., F.R.S.E., Fellow of the Royal College of Physicians of Edinburgh.

MUCH alarm has been created by the outcry raised by some writers in this country and on the continent that small-pox is increasing in consequence of vaccination losing its effects, either from a degeneration of its virus, or from its wearing out of the system after a certain number of years, or from its being but an imperfect preservative against that disease. To check these supposed causes, it has by one class been proposed to go back to the cow for a fresh supply of vaccine matter every two or three years; and Sonderland, Bousquet, Girard, Estlin, Ceely, and others have exerted themselves successfully to procure fresh supplies from that animal. By the other class it has been proposed to repeat vaccination every ten or twelve years; and the Prussian, Hanoverian, Russian, and other governments have actually so far listened to this proposal as to have had their whole standing armies re-vaccinated. While the third class have even seriously proposed to return to the fatal, and now, it is to be hoped, for-ever-exploded plan of inoculating with the small-pox.

Having paid no inconsiderable attention both to small-pox and vaccination; having collected notes and observations for a period of more than twelve years; and being thoroughly convinced that the continued prevalence and fatality of small-pox over all the kingdoms of the globe are owing to an entirely different cause, and as all are aware that the proper preventive means cannot be used unless we know the true cause, I shall, in the development of my views, consider the subject under the four following heads:

1st. Is small-pox a fatal disease at the present day, and has it increased of late years?

2d. Is the prevalence and mortality of small-pox owing to failure in the protective power of vaccination?

3d. Is the prevalence and mortality of small-pox owing to the neglect of vaccination?

4th. Does vaccination afford as perfect protection from small-pox as it is possible to obtain—as perfect immunity from danger as if the person had once passed through the natural or inoculated disease?

*1st. Is small-pox a fatal disease at the present day, and has it increased of late years?*—Before the introduction of vaccination, small-pox was one of the most fatal scourges of the human race; and it was calculated that in Great Britain and Ireland no fewer than between 40,000 and 50,000 were annually cut off by it. In London alone, on an average of fifty years, 2018 died annually from small-pox before the introduction of vaccination. The following table exhibits shortly the state of the mortality from small-pox in London before and since the introduction of vaccination.

*General and Small-pox Mortality, London.*

| Year. | Tot. deaths. | S.-pox deaths. | Year. | Tot. deaths. | S.-pox deaths. |
|---|---|---|---|---|---|
| 1746 | 28,157 | 3,236 | 1811 | 17,043 | 751 |
| 1747 | 25,494 | 1,380 | 1812 | 18,295 | 1,287 |
| 1748 | 23,869 | 1,789 | 1813 | 17,322 | 898 |
| 1749 | 25,516 | 2,625 | 1814 | 19,783 | 638 |
| 1750 | 23,727 | 1,229 | 1815 | 19,560 | 725 |
| 1751 | 21,028 | 998 | 1816 | 20,316 | 653 |
| 1752 | 20,485 | 3,538 | 1817 | 19,968 | 1,051 |
| | | | 1818 | 19,705 | 421 |
| 1795 | 21,179 | 1,040 | 1819 | 19,228 | 712 |
| 1796 | 19,288 | 3,548 | 1820 | 19,348 | 792 |
| 1797 | 17,014 | 522 | 1821 | 18,458 | 508 |
| 1798 | 18,155 | 2,237 | 1822 | 18,865 | 604 |
| 1799 | 18,134 | 1,111 | 1823 | 20,587 | 774 |
| 1800 | 23,068 | 2,409 | 1824 | 20,237 | 725 |
| 1801 | 19,374 | 1,461 | 1825 | 21,026 | 1,299 |
| 1802 | 19,379 | 1,579 | 1826 | 20,758 | 503 |
| 1803 | 19,582 | 1,202 | 1837* | 24,959 | 763 |
| 1804 | 17,038 | 622 | 1838 | 52,698 | 3,817 |
| 1805 | 17,565 | 1,685 | 1839 | 45,441 | 634 |
| 1806 | 17,938 | 1,158 | 1840 | 46,281 | 1,235 |
| 1807 | 18,334 | 1,297 | 1841 | 45,507 | 1,053 |
| 1808 | 19,954 | 1,169 | 1842 | 45,400 | 360 |
| 1809 | 16,680 | 1,163 | 1843 | | |
| 1810 | 19,893 | 1,198 | 1844 | | 1,804 |

The ratio of the mortality from small-pox in London may be otherwise expressed. Thus the following table exhibits the proportion of deaths from small-pox out of every 100 deaths, at intervals, from 1629–1842.†

| Year. | 1629-35 | 1660-79 | 1728-57 | 1771-80 | 1795-1800 | 1801-10 | 1831-35 | 1837-42 |
|---|---|---|---|---|---|---|---|---|
| S.-pox. | 3·78 | 5·09 | 8·00 | 10·03 | 9·30 | 6·95 | 2·69 | 3·02 |

This table, then, though it shows that the mortality from small-pox has greatly diminished since vaccination was introduced, also shows that it has considerably increased of late years.

The following table exhibits the mortality from small-pox over England and Wales, from the Registrar-General's Report.

| Years. | 1838 | 1839 | 1840 | 1841 | 1842 |
|---|---|---|---|---|---|
| Mortality from Small-pox, | 16,268 | 9,131 | 10,434 | 6,368 | 2,715 |

Duvillard‡ has proved, by a reference to the statistics of different countries, that in the natural state (previous to vaccination) of 100 individuals of 30 years of age, scarcely 4 had escaped an attack of small-pox; that two-thirds of all infants were attacked by it sooner or later; that small-pox in the early years after birth destroyed on the greatest average one out of every three who were at-

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[*] Half year only, July to December.

[†] Compiled from M'Culloch's Statistical Account of the British Empire,—Willan on the Diseases of London,—and Reports of the Registrar-General.

[‡] Quetelet on Man.—Chambers' Popular Edit. 1842, p. 45.

tacked with it; and lastly, that one died out of every seven or eight affected with it, at whatever age that might be.

The following table exhibits the deaths from small-pox in Sweden from 1806 to 1830,* with the proportion they bear to the total mortality.

| Years. | No. of deaths. | No. of small-pox deaths. | Propor. of s.-pox to 100 deaths. |
|---|---|---|---|
| 1806-1810 | 75,899 | 8,633 | 11·3 |
| 1811-1815 | 65,478 | 2,429 | 3·7 |
| 1816-1820 | 62,331 | 1,541 | 2·4 |
| 1821-1825 | 58,915 | 1,948 | 3·2 |
| 1826-1830 | 71,115 | 1,639 | 2·3 |

This table shows that the mortality from small-pox in Sweden is still as great as in London, though that country is often quoted as being one where that disease has been almost quite extinguished from the universal adoption of vaccination,†—so often do facts contradict theories.

Through the labours of Drs R. Watt, Cleland, Cowan, and A. Watt, we are furnished with a very complete list of the mortality from small-pox in Glasgow for a long period of years, as the following table‡ of the deaths under ten years of age, will show.

| Year. | Total deaths. | S.-pox deaths. | Year. | Total deaths. | S.-pox deaths | Year. | Total deaths. | S.-pox deaths. |
|---|---|---|---|---|---|---|---|---|
| 1783 | 719 | 155 | 1793 | 1126 | 389 | 1803 | 940 | 194 |
| 1784 | 877 | 425 | 1794 | 759 | 285 | 1804 | 863 | 213 |
| 1785 | 744 | 218 | 1795 | 1048 | 402 | 1805 | 884 | 56 |
| 1786 | 941 | 348 | 1796 | 797 | 177 | 1806 | 786 | 28 |
| 1787 | 1016 | 410 | 1797 | 884 | 354 | 1807 | 899 | 97 |
| 1788 | 1059 | 399 | 1798 | 864 | 309 | 1808 | 1775 | 51 |
| 1789 | 1058 | 366 | 1799 | 1105 | 370 | 1809 | 1187 | 159 |
| 1790 | 1236 | 336 | 1800 | 746 | 257 | 1810 | 1027 | 28 |
| 1791 | 1367 | 607 | 1801 | 766 | 245 | 1811 | 1274 | 109 |
| 1792 | 902 | 202 | 1802 | 985 | 156 | 1812 | 1278 | 78 |
| 1st. Per | 9,919 | 3,466 | 2d. Per. | 9,080 | 2,894 | 3d. Per. | 10,913 | 1.013 |

Thus we see that during the 1st period, or from 1783 to 1792, no fewer than 35·94 died from small-pox out of every 100 who died under ten years of age. From 1793 to 1802, 31·87 died from small-pox out of every 100 at the same ages; while from 1803 to 1812 the mortality from small-pox fell to 9·28 per cent. This fact, while it exhibits the still large mortality from small-pox, most satisfactorily proves the benefits conferred on mankind by the introduction of vaccination—the saving to human life being to the extent of 25 per cent.

Small-pox, however, still continues to prove a fatal disease in Glasgow, as the following table, compiled from the Glasgow Mortality Bills, will show:—

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* Encyclopædia Britannica, 7th Edition, 1842, vol. xv. p. 542.

† Dr Reid's Philosophy of Death. Cupar, 1841, p. 109. Baron's Life of Jenner, &c., 2 vols. 8vo. London, 1838.

‡ Cowan, Vital Statistics of Glasgow, 1838, p. 28.

| Year. | Total deaths. | Small-pox deaths. | Sm-pox deaths under 5 yrs. of age. | Prop. of Sm-pox to 100 deaths. |
|---|---|---|---|---|
| 1835 | 7,849 | 473 | 433 | 6.0 |
| 1836 | 9,143 | 577 | 521 | 6.3 |
| 1837 | 10,886 | 352 | 303 | 3.2 |
| 1838 | 7,515 | 388 | 329 | 5.0 |
| 1839 | 8,130 | 406 | 348 | 4.9 |
| 1840 | 9,541 | 453 | 346 | 4.6 |
| 1841 | 9,605 | 347 | 308 | 3.6 |
| 1842 | 8,019 | 334 | 275 | 4.1 |
| Total | 70,688 | 3,330 | 2,863 | 4.7 |

It is to be regretted that I have not been able to procure the mortality from small-pox in Glasgow for the years intermediate between 1812 and 1835, when, it is to be presumed, the mortality would be less. But from 1835 to 1842 the mortality from that disease is seen from the above table to be nearly 2 per cent. higher than in London during the same period. The above table also shows that the chief deaths from small-pox occurred among the young, in fact, among children under five years of age; and the following table exhibits the proportion which the deaths from small-pox bear to the total deaths among those under five years of age.

*Table of Deaths under 5 years.*

| Year. | Total deaths under 5. | Small-pox deaths under 5. | Proportion of small-pox to 100 deaths. |
|---|---|---|---|
| 1840 | 4031 | 346 | 8.3 |
| 1841 | 4104 | 308 | 7.5 |
| 1842 | 3618 | 275 | 7.6 |

The fact of the increase of small-pox of late years is also shown by reference to the admissions into the Glasgow Infirmary from 1802 to 1836.

*Number of Small-pox Cases in Glasgow Infirmary.*

| Year | No. S.-pox. | Year | No. S.-pox. | Year | No. S.-pox. | Year | No. S.-pox. | Year | No. S.-pox. |
|---|---|---|---|---|---|---|---|---|---|
| 1802 | 0 | 1809 | 10 | 1816 | 14 | 1823 | 46 | 1830 | 10 |
| 1803 | 0 | 1810 | 2 | 1817 | 7 | 1824 | 37 | 1831 | 12 |
| 1804 | 1 | 1811 | 0 | 1818 | 11 | 1825 | 3 | 1832 | 3 |
| 1805 | 3 | 1812 | 4 | 1819 | 7 | 1826 | 1 | 1833 | 14 |
| 1806 | 1 | 1813 | 2 | 1820 | 0 | 1827 | 25 | 1834 | 62 |
| 1807 | 5 | 1814 | 2 | 1821 | 33 | 1828 | 4 | 1835 | 72 |
| 1808 | 0 | 1815 | 4 | 1822 | 5 | 1829 | 1 | 1836 | 110 |
|  | 10 |  | 24 |  | 77 |  | 117 |  | 283 |

Small-pox still cuts off a considerable number in France; but apparently in consequence of the progressive increase in the annual number of vaccinations, from the strict attention which government pays to that subject, the mortality from that fatal disease, instead of increasing as it has done in London, has greatly diminished of late years.

Thus M. Villermé, in his "Tableau relatif aux Vaccinations pratiquées en France, et aux petites Veroles," states that from 1808 to 1826 inclusive, 635,448 cases of small-pox occurred in France, of which 91,807 died. This gives an average of 33,444 cases of small-pox annually from 1808 to 1826, and an annual mortality from that cause of 4,832. To contrast with this I have only been able to procure the returns for 1830, 1835, and 1843, which are given along with the above in the following table:—

*Mortality of Small-pox in France.*

| Year. | Cases of small-pox. | Deaths from small-pox. | Proportion deaths to 100 cases. | |
|---|---|---|---|---|
| Annually from 1808–1826. | 33,446 | 4,832 | 14.4 | or 1 in 6.8 |
| 1830 | 9,764 | 1,340 | 13.7 | or 1 in 7.2 |
| 1835 | 13,726 | 1,893 | 13.7 | or 1 in 7.2 |
| 1843 | 11,779 | 1,379 | 11.7 | or 1 in 8.5 |

From another report by the Royal Academy of Medicine,* it appears that the same fact is evidenced—viz. the diminution of the number of small-pox cases under the persevering extension of the benefits of vaccination. From 1817 to 1837 inclusive, there died of small-pox in Paris 11,451 persons, of whom 7,034 died during the first half of this period, and only 4,417 during the latter half. The annual average of deaths from small-pox during the first half of the above period was 1,090, while during the latter half the annual average fell to 420.

These facts, then, go to prove that, while small-pox is extending its ravages in this country, it is progressively diminishing over France; and we shall have occasion, under another head, to show that this is owing to the more general adoption of vaccination in that country.

Ireland has often been quoted as one of those countries where vaccination has been very generally adopted. Even Dr Cowan, in 1838, repeats the unauthenticated statement. The Government Census of 1841 proves, however, both what a fearful scourge small-pox is in that country, and how lamentably vaccination is neglected. During the ten years ending June 1841, no fewer than 58,006 were cut off by small-pox; giving an annual average of 5,800 deaths from that fatal disease. This gives a proportional mortality from small-pox of 4·9 out of every 100 deaths—a mortality higher than that of London, and nearly the same as that of Glasgow. Now, using round numbers, and allowing the annual average of deaths from small-pox to be 1000 in France, with a population of thirty-three millions; we have four times that mortality in Ireland from the same disease with less than a fourth of the population, viz. an annual mortality from small-pox of 5800, with a population of only eight millions.

Being anxious to ascertain how Edinburgh stood affected by small-pox, I have, with considerable labour, gone over the records of the burying grounds so far as these are complete in the enumeration of the diseases, and offer the following as the most perfect which the state of these records will allow.

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* Bulletin de l'Academie Royale de Médecine, vol. iii, p 1, &c.

*Edinburgh Mortality Table*, 1780–1844.*

| YEAR. | Total deaths. | Deaths from small-pox. | Prop. of S.-Pox per 100 deaths. | YEAR. | Total deaths | Deaths from small-pox. | Prop. of S.-Pox to 100 deaths. |
|---|---|---|---|---|---|---|---|
| 1780 | 1554 | 215 | | 1810 | 1587 | 24 | |
| 1781 | 1471 | 340 | | 1811 | 1656 | 48 | |
| 1782 | 1801 | 237 | | 1812 | 1580 | 30 | |
| 1783 | 1542 | 201 | | 1813 | 1658 | 23 | |
| 1784 | 1685 | 178 | | 1814 | 1550 | 10 | |
| 1785 | 1520 | 135 | | 1815 | 1505 | 40 | |
| 1786 | 1714 | 378 | | 1816 | 1911 | 12 | |
| 1787 | 1787 | 181 | | 1817 | 1709 | 12 | |
| 1788 | 2031 | 225 | | 1818 | 1967 | 35 | |
| 1789 | 1958 | 318 | | 1819 | 2266 | 43 | |
| 1780—1789 | 17063 | 2408 | 14·1 | 1810—1819 | 17389 | 277 | 1·5 |
| 1790 | 1906 | 160 | | 1820 | 2639 | 65 | |
| 1791 | 2377 | 339 | | 1821 | 2794 | 23 | |
| 1792 | 1315 | 171 | | 1822 | 2747 | 30 | |
| 1793 | 1387 | 173 | | 1823 | 3298 | 64 | |
| 1794 | 1201 | 286 | | 1824 | 2902 | 67 | |
| 1795 | 1164 | 70 | | 1825 | 3941 | 24 | |
| 1796 | 1239 | 269 | | 1826 | 3824 | 20 | |
| 1797 | 1102 | 119 | | 1827 | 3610 | 109 | |
| 1798 | 1214 | 95 | | 1828 | 3934 | 11 | |
| 1799 | 1172 | 184 | | 1829 | 3423 | 7 | |
| 1790—1799 | 14077 | 1866 | 12·5 | 1820—1829 | 33112 | 420 | 1.2 |
| 1800 | 898 | 40 | | 1830 | 3771 | 192 | |
| 1801 | 1008 | 97 | | 1831 | 3937 | 15 | |
| 1802 | 1032 | 61 | | 1832 | 5512 | 12 | |
| 1803 | 1419 | 32 | | 1833 | 4595 | 97 | |
| 1804 | 1499 | 72 | | 1834 | 3936 | 76 | |
| 1805 | 1483 | 36 | | 1835 | 3801 | 68 | |
| 1806 | 1359 | 22 | | 1836 | 4209 | 43 | |
| 1807 | 1184 | 38 | | 1837 | 5300 | 195 | |
| 1808 | 1420 | 40 | | 1838 | 4560 | 97 | |
| 1809 | 1142. | 19 | | 1239 | 3654 | 41 | |
| 1800—1809 | 12444 | 457 | 3·6 | 1830—1389 | 43275 | 836 | 1·9 |

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* The records of the Grayfriars burying-grounds are imperfect in the enumeration of the diseases from 1792 to 1819; those of the Calton from 1780 to 1786; those of the Canongate from 1807 to 1809; while the records of the Crosscauseway Chapel burying-grounds are lost from 1799 to 1802, and from 1820 to 1824. St John's Chapel burying-ground records do not take cognizance of the diseases at all. All these are therefore omitted in the above table.

| Year. | Total deaths. | Deaths from Small-Pox. | Proportion of Small-Pox per 100 deaths. |
|---|---|---|---|
| 1840 | 3983 | 164 | |
| 1841 | 3888 | 27 | |
| 1842 | 4154 | 181 | |
| 1843 | 4841 | 39 | |
| 1844 | 4264 | 11 | |
| 1840—1844 | 21130 | 422 | 1·9 |

It will render this table more easily comparable with that of London if we class together in one table the proportion of deaths from small-pox out of every 100 deaths during periods of ten years.

*Proportion of small-pox deaths out of every* 100 *deaths in Edinburgh during the years,—*

| 1780–89 | 1790–99 | 1800–09 | 1810–19 | 1820–29 | 1830–39 | 1840–44 |
|---|---|---|---|---|---|---|
| 14·1 | 12·5 | 3·6 | 1·5 | 1·2 | 1·9 | 1·9 |

This table, then, though it demonstrates that the mortality from small-pox in Edinburgh for the last few years is nearly a half lower than in London, and less than a half lower than in Glasgow, exhibits, like these cities, a slight increase of late years.

In Prussia, though small-pox, from the attention which government pays to vaccination, is far from that dreadful scourge which it is in this country, it will be seen from the following returns that it still forms a fraction of the mortality.

*General and Small-Pox Mortality in Prussia.*

| Year. | Total deaths. | Deaths from small-pox. | Proportion of S.-pox to total deaths. |
|---|---|---|---|
| 1820—1834 | 5,457,209 | 44,685 | 1·3 per cent. |
| or annually | 363,813 | 2,979 | 1·3 |
| 1839 | 430,098 | 2,128 | 0·4 |
| 1840 | 418,624 | 2,410 | 0·5 |
| 1841 | 415,256 | 2,195 | 0·5 |

In the Austrian dominions, again, small-pox still commits fearful ravages, as the following table of returns from some of the provinces, for 1832, 1833, and 1836,* will demonstrate.

*Small-Pox Mortality in Austrian Dominions.*

| 1832. | No of S.-Pox. | 1836. | No. of S.-Pox. |
|---|---|---|---|
| Austria on the Enns, | 1683 | Austria on the Enns, | 564 |
| Dalmatia, | 36 | Styria, | 394 |
| Hungary, | 1545 | Bohemia, | 679 |
| Venetian territories, | 9687 | Moravia and Silesia, | 146 |
| | | Galicia, | 1262 |
| 1833. | | Lombardy, | 766 |
| Austria on the Enns, | 5466 | Dalmatia, | 839 |
| Moravia and Silesia, | 177 | Carinthia, | 98 |
| Styria, | 1491 | Carniola, | 266 |
| Illyria, | 3148 | Maritime territories, | 98 |
| Maritime territories, | 160 | Tyrol, | 349 |

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* Medicinische Jahrbucher des Osterr. Staates 1835 and 1838, and Allgemeines Repertorium, 1836 and 1839.

I regret that I have not been able to procure the returns from the whole of the provinces for any one complete year. The above were all the returns for these years published in the journals referred to.

From this review, then, of the mortality from small-pox in many of the kingdoms of Europe we see that it is still a very fatal and prevalent disease; and that in several of them, particularly in our own land, it has been rather on the increase of late years. Every one, therefore, will see the importance of ascertaining the true cause of this fatal prevalence; as, unless the cause be ascertained, we cannot hope to apply the remedy. It is from having completely misunderstood the cause, that so many fanciful theories have been started to account for its prevalence; and that physicians have almost always attributed it to some assumed fault of the vaccine lymph, as if it were from some failure in its protective power that the small-pox continued to rage. I trust I shall be able to prove by unquestionable facts what the true cause is, and thus enable all to apply the remedy.

*2dly. Is the prevalence and mortality of small-pox owing to failure in the protective power of vaccination?* Scarcely was vaccination introduced into general practice, and its decided efficacy proved, than a few individuals were found so wedded to old prejudices, so averse to open their eyes to facts in medicine, that they asserted its virtues were merely temporary, and would wear out of the system in a few years, leaving it as unprotected from small-pox as if no vaccination had taken place. Others not only used this argument, but also stated that, within ten years after its introduction, the vaccine virus was visibly decreasing in protective power, and that in a few years thereafter it would no longer be able to produce that change in the system which should enable it to resist an attack of small-pox. A period of forty-five years has now elapsed since vaccination was generally introduced, not only to Britain, but to almost all countries of the globe, and I shall endeavour very shortly to show how far the theoretical fears of these disbelievers of its antivariolous powers have been fulfilled.

In endeavouring to estimate the antivariolous powers of the vaccine lymph, we must endeavour to ascertain the exact state of the population with regard to vaccination, or at least of that portion to which we refer for proofs of its protective powers. It is therefore perfectly apparent that we cannot refer to the *general* population of any country, seeing that we do not possess any accurate statistical tables of the number vaccinated and unvaccinated; and from this circumstance the occurrence of cases of small-pox among the general population, of itself neither proves nor disproves a single point connected with this subject. We have, however, even thus an approximative proof that the vaccine virus neither wears out of the constitution, nor yet degenerates by its numerous transmissions through the human subject. The tables which we have given above demonstrate that the mortality from small-pox has most materially decreased since vaccination became general. If, however, the protective powers of vaccination failed in ten, fifteen, or twenty years, by this time the whole of the adult population ought to be as liable to small-pox as if they had never been vaccinated; and, if the vaccine lymph degenerated after a period of twelve or twenty years, all those who had been vaccinated with matter which had been twelve or twenty years in use,—that is, all those under twenty years of age ought to be equally liable to an attack of small-pox. In fact, on this supposition the whole population ought to be as liable to an attack of small-pox as if they had never been vaccinated—the old, because by this time the protection afforded by one vaccination had worn out of the constitution—the young, because they were vaccinated with such exhausted virus, that it could afford no protection against small-pox for more than one or two years. What, however, is the case? Not only is small-pox rare in the adult over Britain generally, but the chief cases occur among children under five years, in the very class who, according to any supposition, ought, *if vaccinated*, to be the most perfectly protected. Thus in the Registrar-General's Report of the mortality of England and Wales for the year 1838, it is stated that the ages of 8706 persons who died of small-pox was obtained, and it was found that no fewer than 7575 were under five years of age, and only 1131 above that age. The same conclusion is arrived at from consulting the able statistical report of Dr Watt on the mortality in the large towns of Scotland, in the Transactions of the British Association, by which it appears, that over the whole kingdom the average per centage of deaths from small-pox is nearly the same for those under five years of age. Thus in 1839, in Manchester, 89·341 per cent. of those who died from small-pox were under five years; in Liverpool, 85·328 per cent. were under five; in Edinburgh, 82·683 per cent.; in Glasgow, 85·729 per cent.; in Perth, 87·755 per cent.; and in Dundee, 85·258 were under five years of age out of every 100 who died of small-pox. The statistics of Ireland, again, exhibit this fact in a very striking light. In the "Report of the Commissioners appointed to take the census of Ireland for the year 1841," we find that, for the ten years ending 6th June 1841, no fewer than 58,006 deaths occurred from small-pox. Of these, however, no fewer than 49,038 were under five years of age, while only 8,968 were above that age.

These facts, therefore, prove approximatively that the protective power of the vaccine virus does not wear out of the constitution in ten or twenty years, otherwise the great mortality would be among adults and not among children. As we shall have occasion to notice afterwards, it is more than probable that the mortality from small-pox among children is from no failure in the protective power of vaccination, but from their never having been vaccinated.

It is necessary, however, in a rigid inquiry after truth, to ascertain whether a class of men who are properly vaccinated are thereby for ever after protected from the ravages of small-pox. Of only one class of men can it be said that means are taken to ensure that all are protected by vaccination from the ravages of that loathsome disease—I mean the military class. Let us see, therefore, how far they are protected from that disease, or whether, as they advance in years, they become more liable to be attacked by it.

From the Government "Statistical Reports of the sickness, mortality and invaliding among her Majesty's troops," extending from 1817 to 1836 inclusive, we learn that the dragoon regiments and guards, with an aggregate strength during that period of 44,611, and a total mortality of 627, lost only 3 cases from small-pox. The troops at Gibraltar, with an aggregate strength during that period of 60,269, and a total mortality of 1291, lost only one from small-pox. In the West Indies the British or white troops, with an aggregate strength, from 1817 to 1836 inclusive, of 86,661, and a total mortality of 6,803, had not a single death from small-pox, though several epidemics of small-pox have ravaged the islands during that period. The black troops on the same station with an aggregate strength during the same period of 40,934, and a total mortality of 1645, completely escaped that loathsome disease. At Bermuda at Nova-Scotia, at New Brunswick, at the Cape of Good-Hope, and at the Mauritius not a single death from small-pox occurred during these twenty years; and even the white troops of Western Africa wholly escaped this disease, which was carrying off hundreds of the black unprotected population.

With regard, however, to three other important stations, we are, from other sources, furnished with the means of comparing the mortality of small-pox among the only partially protected general population with that among the protected troops. In Malta the British troops from 1818 to 1836 inclusive had an aggregate strength of 40,826, and a total mortality of 665; only two deaths, however, occurred from small-pox. Among the civil population of Malta, however, epidemic small-pox broke out in 1830, and continued during the whole of that and the succeeding year, carrying off no fewer than 1,169 persons, being 1048 deaths from small-pox out of a mortality of 3407 during the year 1830; and 121 out of a mortality of 2581 in 1831. This fact, then, shows the perfect protection which was afforded to the properly vaccinated troops; for while small-pox was raging so fearfully among the native Maltese that a third of the mortality was caused by that disease in 1830 alone, only two fell victims to its severity among the military during the extended period of 19 years.

In Ceylon, again, the small-pox during the period included in the Government reports has thrice broken out in an epidemic form; besides the cases which are always occurring in the sporadic form; and we learn from the excellent report of Dr Kinnis,* who was for several years superintendent of vaccination in the Colombo district, that these were in 1819, 1830 and 1834. These are the only years during which accounts were kept of the cases of small-pox among the native population, and it is stated that in

1819, there occurred 7,874 cases of small-pox, of which 2,945 died.
1830 . 806 . . 169
1834 . 425 . . 94

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* A Report on Small-pox as it appeared in Ceylon in 1833–34. Colombo, 1835.

The statistical reports show that from 1817 to 1836 inclusive, the white troops in Ceylon, with a total mortality of 3000, lost only 4 from small-pox, 8 cases alone of that disease having occurred; the Malay troops, with a total mortality of 858, lost only 9 from small-pox; while the Pioneer corps, with a mortality of 647, lost only one from that fatal disease. Dr Kinnis states, that during the last epidemic of small-pox not a case occurred among any of the white or native troops.

Equally conclusive facts we find in the Madras army statistics,* published by Government, under the superintendence of Dr George Pearse, Secretary of the Medical Board, Madras. The European troops of the Madras Presidency division, from 1829 to 1838 inclusive, a period of ten years, had an aggregrate strength of 103,431, and a total mortality of 4,725; of this number, however, only 2 deaths were from small-pox.† To exhibit, however, the prevalence of small-pox among the native population with whom the troops were in habitual intercourse, it is mentioned that in the native infirmary there, from 1827 to 1838 inclusive, no fewer than 352 cases of small-pox were admitted, of which 179 died.

Among the European troops of the southern division of the Madras army, not a single case of small-pox occurred, from 1834 to 1838 inclusive, though it prevailed to a considerable extent among the native inhabitants. Indeed, Mr Morgan, in his medical report of the 57th regiment, published in the Madras Quarterly Medical Journal for April 1840, states that although small-pox almost constantly exists in Cannanore or some of the neighbouring villages, in which the regiment was stationed, not a single case had occurred among the men of that regiment up to the date of the report.

I have not been able to learn whether any cases of small-pox occurred among the white troops at Calcutta from 1832 to 1834, but the following table‡ will exhibit the fearful ravages of that disease among the native population during that period—a population which is only very partially vaccinated, and is reckoned at about 300,000.

| | | | |
|---|---|---|---|
| 1832—died of small-pox,— | 679 | 1839—died of small-pox,— | 81 |
| 1833 | 2548 | 1840 | 22 |
| 1834 | 36 | 1841 | 56 |
| 1835 | 53 | 1842 | 25 |
| 1836 | 16 | 1843 | 336 |
| 1837 | 266 | 1844 | 2924 |
| 1838 | 1507 | | |

"In the villages around Calcutta, (we learn from Dr Stewart's report,) the mortality was fearfully great, and in many instances whole families were swept away."

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* Report on the Medical Topography and Statistics of the Presidency Division of the Madras Army. Madras, 1842.

† The "Report of Committee of the Statistical Society of London on the Sickness and Mortality among European and Native Troops serving in the Madras Presidency," includes the specification of diseases for a period of twelve years, from 1827 to 1838. During this period the total mortality among the European troops was 6,221, but only two from small-pox, as in the Government returns for a shorter period. In fact, the small pox deaths occurred in the years 1837–38.

‡ Dr Stewart's Report on Small-pox in Calcutta, and Vaccination in Bengal. Madras Spectator, Dec. 7, 1844.

These are the only definite facts on which I have been able to lay my hands relative to the protective powers of vaccination. It is to be remembered that when a recruit is examined for the army, attention is always paid as to whether he has been vaccinated or not ; and if he has not gone through that preventive, or had small-pox naturally, he is forthwith vaccinated. It is only therefore of the military we can procure distinct proofs that all have undergone vaccination ; and when we find that these men resist the small-pox when living in constant intercourse with a people among whom it is committing fatal ravages, we are forced to conclude that the vaccine virus has neither degenerated in protective power in consequence of its frequent transmissions through the human subject, nor does its protective power materially wear out of the constitution after a lapse of years.

Having thus shown that the existing prevalence and mortality of small-pox is not owing to any failure in the protective powers of vaccination, we proceed in the next place to inquire,—

*3dly. Is the existing prevalence and mortality of small-pox owing to the neglect of vaccination?* Few facts have been published relative to the numbers of the inhabitants of any country protected by vaccination ; yet several incidental facts are noticed, which allow us to estimate comparatively the proportion of the population who have been vaccinated. These facts are all the more valuable that they have not been published with the view of proving any particular theory, but are mentioned incidentally in the course of treating of other subjects.

M. Bousquet, in his "Traité de la Vaccine," mentions, relative to the population of Marseilles, that in 1825, when attacked with an epidemic small-pox, the population was divisible into three classes ; 30,000 had been vaccinated ; 8,000 had neither been vaccinated nor had small-pox ; and 2000 had been inoculated with small-pox, or had the small-pox naturally. A whole fourth of the population was therefore unprotected against small-pox, and the natural consequence was, that, during the fatal epidemic which at length attacked them, no fewer than 1448 died of this disease in a few months.

M. Villermé, in his interesting paper entitled "Tableau relatif aux Vaccinations pratiquées en France, et aux petites Veroles,"* states that from 1808 to 1826 there occurred over France 10,815,996 births, of which only about one-half, or 5,845,003, were vaccinated ; *thus leaving the half of the population exposed to the ravages of small-pox.* The natural consequence of this unprotected state of such a number of the population was abundantly evidenced by the fact, that during these years, viz. from 1808 to 1826 inclusive, no fewer than 635,448 cases of small-pox occurred, of which number 91,807, or 1 in 6.8, died, and 45,302, or 1 in 12.4 of the remainder were rendered invalids or disfigured ; giving an average mortality from small-pox for each of these years of 4832.

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* Annales d'Hygiene Publique, vol. i. 1829, p. 480.

Almost every year exhibits the same carelessness with respect to vaccination, and the usual consequence, viz. a great amount of deaths from small-pox. Thus in 1830 there were born in France 398,516, of whom only 253,972 were vaccinated. During that year there occurred 9,764 cases of small-pox, of which 1340 died, or 1 in 7.2, and 831 were disfigured or rendered invalids.

In 1835, again, 745,444 births occurred in France, only 518,734 of whom were vaccinated. During that year 13,726 cases of small-pox occurred, of which 1893 died, or 1 in 7.2, and 1486 were disfigured or rendered invalids.

In 1843, again, 910,387 births occurred, of which only 547,646 were vaccinated; or in the proportion of 60.1 to every 100 births. During that year 11,779 cases of small-pox occurred, of which number 1379 died, or 1 in 8.5. The following table will exhibit these statements at a glance.

*France* 1808–1843.

| Year. | Births. | No. vaccin. | Prop. vaccin. to 100 births. | No. cases of small-pox. | Deaths from small pox. | Propor. deaths to 100 cases. | Numerical proportion. |
|---|---|---|---|---|---|---|---|
| 1808–1826 | 10,815,996 | 5,845,003 | 54.0 | 635,448 | 91,807 | 14.4 | or 1 in 6.8 |
| 1830 | 398,516 | 253,972 | 63.7 | 9,764 | 1,340 | 13.7 | or 1 in 7.2 |
| 1835 | 745,444 | 518,734 | 67.1 | 13,726 | 1,893 | 13.7 | or 1 in 7.2 |
| 1843 | 910,387 | 547,646 | 60.1 | 11,779 | 1,379 | 11.7 | or 1 in 8.5 |

These facts therefore show that in France, where government pays much attention to vaccination, a very large proportion of the population neglect the blessings offered them gratuitously, and thus keep up an infectious and loathsome disease continually among them. If we look to the mortality, however, of this disease in France during the years above enumerated, we shall see that it is the very same as before the introduction of vaccination, being about 1 in 7 attacked with the disease. This fact then of itself demonstrates that the cases attacked were those which had never been vaccinated. This conclusion is, however, verified by the last French Government Report which has reached me, viz. that of 1843, published in the Journal des Debats. After enumerating the births and number of vaccinations, it states that "of those not vaccinated 11,779 were attacked with the small-pox." In fact, the number of cases given in the table above.

Though a little out of the immediate object of inquiry, a strong fact may be mentioned, showing the influence of vaccination in diminishing the proportion of cases of small-pox, and of course in diminishing the mortality from that disease; and as the fact shows what perseverance in the use of protective means on the part of government can do, I make no apology for introducing it here. The French government pays much attention to the extension of vaccination, and it is a notable fact, much to their credit, that the numbers vaccinated have steadily increased since 1826, and just in that proportion the cases of small-pox have diminished in number.

Thus, from 1808 to 1826 the proportion of vaccinations to births was nearly the same during all that period, being 540 vaccinations for every 1000 births, or very nearly as 5 to 10. During that period the annual average of deaths from small-pox over France was 5100. By 1838 the proportion of vaccinations to births had only increased as 5 to 8; yet the annual average of deaths from small-pox had fallen to about 1500.

In Paris alone, from 1817 to 1827. there died from small-pox 7034,
but from 1827 to 1837 the mortality fell to 4417.

Or, in other words, so long as the proportion of vaccinations did not exceed one-half or five-tenths of the births, the mortality from small-pox in Paris averaged 1090 per annum; but when the vaccinations amounted to five-eighths of the births the average annual mortality from small-pox in Paris fell to 420. This statistical fact certainly holds out the strongest motive for perseverance, and even excites the hope that the universal adoption of vaccination would quite extinguish the small-pox.

In Sweden, again, we learn from the tables which have from time to time been published, that vaccination is neglected even there to a much greater extent than most writers on vaccination would have previously believed. The following table, compiled from the government returns, will exhibit this fact in its true light.

*Table of Annual Proportion of Vaccinations to Births in Sweden.*

| Years. | Annual aver. of births. | Annual aver. of num. vacc. | Annual aver. unpro. by vac. | Ann. propor. of vac. and unvaccin. to 100 births. Vaccinat. | Unvac. |
|---|---|---|---|---|---|
| 1816–25, | 90,480 | 63,491 | 26,989 | 70·1 | 29·9 |
| 1826–30, | 94.946 | 62,972 | 31,974 | 66·3 | 33·7 |
| 1831–35, | 95,359 | 68,145 | 27,214 | 71·4 | 28·6 |

From this table we learn that nearly a-third of the population are unprotected by vaccination. Or, if we allow for the deaths which occur among the infants previous to vaccination, that a fourth of the population of Sweden are unprotected from the ravages of small-pox by having never been vaccinated. That small-pox should keep its hold among such an unprotected population need therefore surprise no one; the chief wonder, indeed, is that the mortality from that disease should be so small as the table formerly given shows it is.

The Austrian government has published a statement relative to vaccination, which exhibits in a very strong light the point for which I am now contending, viz. that small-pox is kept up from the neglect of vaccination, and that a very large proportion of the population are unprotected by vaccination. The following table exhibits the returns from a few of the Austrian provinces for 1832 and 1833. I know not whether similar returns were made for the other provinces.

| Years. | Provinces. | Number vaccinat. | No. in which vac succeeded | No. in which vac failed. | Number remaining unvaccin. | Cases of small-pox. | |
|---|---|---|---|---|---|---|---|
| | | | | | | Inoculat. | Not inoc. |
| 1832. | Dalmatia, | 9,266 | 9,132 | 134 | 604 | 8 | 28 |
| | Hungary, | 185,972 | 184,834 | 1,138 | — | — | 1,545 |
| | Venetian Territories, | 53.222 | 52,740 | 2,482 | 15,416 | 3,981 | 5,706 |
| | Austria on the Enns, | 19,143 | 18,023 | 1,120 | 20,748 | — | 1,683 |
| 1833. | Austria on the Enns, | 17,690 | 17,095 | 595 | 18,559 | 177 | 5,289 |
| | Moravia and Silesia, | 70,302 | 67,500 | 2,802 | 12,400 | 59 | 118 |
| | Styria, | 20,005 | 19,202 | 803 | 5 331 | — | 1,491 |
| | Illyria, | 17,119 | — | — | 3,964 | 718 | 2,430 |
| | Maritime Territories, | 14,432 | 14,260 | 172 | 2,538 | 27 | 133 |

From this table it appears, not only that about 1 out of every 43 failed to take the infection of vaccination, but, what especially concerns our present inquiry, that "*more than one-fifth of the total population, remained unvaccinated.*" Such are the words of the Report; and with such a state of the population who can wonder that upwards of 10,000 cases of small-pox should annually occur in these dominions; or that the contagion, once rendered virulent by concentration, should spread also to the vaccinated and inoculated!

The same facts are exhibited by considering the state of vaccination and small-pox in Ceylon. We learn from the "Report of the Committee of Legislative Council for the examination of witnesses respecting small-pox and chicken-pox," that, excepting during the actual prevalence of a small-pox epidemic, the Ceylonese greatly neglect vaccination;* and even when they did subject themselves to it, it was frequently so very carelessly and inefficiently conducted that "twenty or twenty-five people were vaccinated from one pustule," (p. 23.) We learn, however, from the same "Report," that when vaccination was perfectly attended to, and all or nearly all the natives in the maritime provinces were vaccinated, small-pox was completely banished from the island. It is to be remembered that all the central portions of the island, or the Kandian Provinces, only came into the British possession in 1815, so that the above statement does not apply to them. This long period of freedom from the epidemic small-pox induced carelessness and additional unwillingness to be vaccinated, on the part of the natives, and for some years previous to 1819 vaccination was comparatively neglected. During that year 7874 cases of small-pox were reported to government as having occurred, of which number 2945 died. It is very unlikely, however, that all the cases which occurred came under the notice of government,* as we learn that the natives had the utmost dread of being taken to the hospitals; but from the instructive paper of Mr Henry Marshall, then staff-surgeon at Kandy, we learn that such was its virulence in the district over which he presided, that of 931 cases admitted into the small-pox hospital at Kandy, more than the half, or 525 died,—a mortality exactly double what it was the year previous to the introduction of vaccination.

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* Mr Henry Marshall, Deputy-Inspector-General of Army Hospitals, who spent many years of service in Ceylon, informs me that little confidence can be placed in the numbers returned as vaccinated. The Ceylonese had an idea that, in pressing on them the benefits of vaccination, it was done with the view of marking them, and subsequently exacting from all so marked some tax or labour service. They did not, therefore, apply to be vaccinated. The native vaccinators went to the bazaars, and vaccinated there all whom they could persuade to submit to it; but, as they rarely saw the persons again, they could not know how many were properly vaccinated. Besides, it was always believed that these native vaccinators returned the names of more than they had actually vaccinated, to make it appear they were working for the pay given them by the British Government.

Dr Kinnis, in his highly valuable "Report on Small-pox as it appeared in Ceylon in 1833–34," mentions that "during the thirty-three years which have elapsed since the first introduction of vaccination, terminating with December 1834, the whole number vaccinated has been 822,321." But the population of the island in 1833, the kingdom of Kandy excepted, was 1,126,808. This fact demonstrates that, even on the very improbable supposition that all the vaccinated cases were alive at that period, no fewer than 304,477 must have been unprotected, and consequently liable to small-pox. We know, however, that not exceeding one-half of the cases vaccinated could have been living in 1833, and that consequently a full half of the population must have remained liable to be attacked with small-pox. We need not therefore be astonished that small-pox still rages epidemically among the natives of Ceylon; but, instead of attributing it to any degeneration of the vaccine lymph, or to the protective power wearing out of the system, common sense teaches us to attribute it to its true cause—the neglect of vaccination.

M. Heim† a few years ago published a "History of the Varioloid Epidemic in Wurtemberg from 1831 to 1836," from which it appears that, in that small kingdom, no fewer than 1677 cases of small-pox and the varioloid disease were admitted into the public hospitals during that period. The same neglect of vaccination seems to prevail here as in the above-recorded instances, for we find that, of 643 cases of true small-pox, 457 had not been vaccinated.

I have not been able to procure any equally satisfactory facts relative to our own country; but, even with regard to it, we may procure some facts which show approximatively the extent to which vaccination is neglected, and consequently small-pox is kept up.

The following table, published by Dr Gregory of the Small-pox

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* Mr Marshall, from his own observation, is convinced that not a tenth of the cases of small-pox came under the notice of Government. The Ceylonese believe that small-pox depends on the presence of an avenging deity. Whenever, therefore, a person is seized with it, they all forsake him and leave him to his fate. When it raged epidemically in 1819, even Kandy itself was thus deserted, and Mr Marshall, during his morning rides around the cottages in the outskirts of Kandy, found them completely deserted, and the unfortunate beings who had small-pox left to their fate in the outhouses, &c. In so far as the province of Kandy was concerned, returns were only made of those admitted into the small-pox hospital at Kandy; and it was the same over the other districts of the island.

† Bulletin Medicale Belge, Aug. 1839, p. 197.

Hospital, London, exhibits the mortality from that disease of the cases admitted to the hospital, during a period of fifty-six years.

| | | | | |
|---|---|---|---|---|
| Years 1780—9, | cases of small-pox | 2954, | deaths | 1031=34·90 per cent. |
| 1790—9, | - - | 2322, | - | 763=32·36 |
| 1800—9, | - - | 1574, | - | 478=30·37 |
| 1810—9, | - - | 1188, | - | 357=30·05 |
| 1820—9, | - - | 2225, | - | 658=29·57 |
| 1830—5, | - - | 1590, | - | 388=24·40 |

Of 2191 cases of these, whose state as to vaccination was ascertained, being the last cases admitted, it appeared that

| | | | | |
|---|---|---|---|---|
| 1393 | cases were not vaccinated, | of which 571 | died, or | 41·1 per cent. |
| 789 | - vaccinated, | - 46 | - | 5·8 |
| 9 | - inoculated, | - 2 | - | 22·2 |

This also demonstrates that the great proportion of those who fall victims to small-pox are those who are unprotected by vaccination, and are consequently liable to small-pox.

To Henry Marshall, Esq. Deputy-Inspector-General of Army Hospitals, I am indebted for the following statement, which shows the same fact. The statistics of recruiting for the whole British army, (English, Scots, and Irish,) during the year ending 31st March 1844, show that, of 11,514 men found fit for service,

8418 had distinct marks of vaccination,
2711 had marks of small-pox,
385 had no distinct marks of either.

This statement, therefore, shows that, of 11,514 men taken in a manner at random over the whole kingdom, more than a third had either already had small-pox or were still liable thereto. In fact, it shows that only two-thirds had been protected from small-pox by vaccination. But it proves more. It proves that of every 100 men of the ages of 18 to 20, (the usual ages of recruits,) who had not been vaccinated, small-pox had already seized ninety of them. So true is the observation of Duvillard, that, of 100 men of the age of 30, who have not been protected by vaccination, not exceeding four will be found to have escaped the small-pox. If these men, therefore, be taken as a fair average of the lower orders in this country, and their state relative to vaccination be considered as exhibiting the state of the lower classes generally with regard to vaccination, what a fearful apathy and disregard of the use of protective means against a loathsome distemper does it exhibit! And how can any one wonder that, with no more than two-thirds of the population vaccinated, small-pox should prove nearly as fatal annually as it did before the illustrious Jenner discovered the protective powers of the vaccine lymph. Before the introduction of vaccination it was calculated that small-pox cut off annually about 30,000 of the population of Great Britain. This was but a rude guess, and probably overestimated the actual mortality. But the Mortality Bills demonstrate that, even in 1838, no fewer than 16,267 were cut off by small-pox in England and Wales alone.

It is quite consistent with observation to conclude that all the cases of small-pox which occur among children under five are among the unvaccinated. This conclusion is arrived at by every one who has written on the subject, and from my own investigations into the deaths of children from small-pox for several years past in Edinburgh, I am satisfied that the conclusion is quite legitimate. Indeed, one of the recorders of the Edinburgh burying-grounds has for some time past been making inquiries for me relative to this very point, and he assures me that not one of the cases of death from small-pox which he has lately recorded has occurred in a vaccinated subject.

Now, it is stated in Dr Watt's "Vital Statistics of Large Towns in Scotland,"* that in Edinburgh, from 1839 to 1841, no fewer than 82.683 out of every 100 deaths from small-pox were under five years of age; in Glasgow, 85.729 per cent. were under five years from 1837 to 1841; in Perth, 87.755 per cent. were under five; and in Dundee, 85.258 per cent. under five years of age. In the records of the Canongate burying-grounds, where the ages as well as the diseases of the deceased are recorded, I find that from 1780 to 1836, 1068 cases of small-pox are recorded; of which number only 36 were above five years of age. Or, in other words, 96·7 of every 100 were under five years of age, and only 3·3 above that age. It may also be stated that by far the greatest proportion of the cases under five years of age, I should say four-fifths, were under one year. The chief mortality, therefore, from small-pox in Scotland is in the unvaccinated; in fact, it is by them the disease is kept up.

The very same is true of England. In the Report of the Registrar-General for 1838, we find that of 8,706 cases of small-pox, in which the ages were ascertained, no fewer than 7,583 were under five years of age, or 85·9 per cent.

In Ireland, again, we learn from the "Report of the Commissioners appointed to take the Census of Ireland for the year 1841," that for the ten years ending 6th June 1841, no fewer than 58,006 deaths from small-pox occurred, of which 49,038 were under five years of age, or 84·5 per cent. From Dr Griffin's excellent "Inquiry into the Mortality occurring among the Poor of the City of Limerick,"† the same conclusion may be deduced. Of 393 cases of small-pox, 333 were under five years of age; 55 were between five and ten; and the remaining 5 were under fifteen years of age. Dr Griffin remarks that he could not ascertain whether any of these cases were vaccinated, but he did ascertain that 16 *of the deaths arose from the children having been inoculated with small-pox.*

From all these statements, then, the only rational conclusion seems to be that the small-pox is kept up and its ravages extended by the neglect of vaccination—a neglect to an extent of which none seems to have had any idea.

Being anxious to ascertain the actual state of our pauper population relative to vaccination and small-pox, I took the opportunity in December 1841, of making inquiries into the subject, when taking up the names of families requiring relief in two districts of the Old Greyfriars parish in Edinburgh. The following table exhibits the actual state of 73 families whom I visited as to this point.

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* Transactions of the British Association, 1842.

† Quarterly Journal of the Statistical Society of London, Jan. 1841, p.316.

| Names of Heads of Families. | No. of Family. | No. Vac. | No. had S.-Pox. | S.-Pox after Vaccin. | S.-Pox after S.-Pox | No. Unprotected. |
|---|---|---|---|---|---|---|
| Thomas Fullerton, | 7 | 3 | — | 1 | — | 4 |
| Daniel Ross, . | 4 | 4 | — | 1 | — | — |
| Thomas Dillon, . | 4 | 2 | — | — | — | 2 |
| Adam Innes, . | 4 | 3 | — | — | — | 1 |
| Anne Clark, . | 5 | 4 | 1 | — | — | — |
| Catherine Straiton, | 2 | 2 | — | — | — | — |
| Marion Forrest, . | 1 | — | 1 | — | — | — |
| John Mackay, . | 2 | 2 | — | — | — | — |
| Eliza Cameron, . | 1 | — | 1 | — | — | — |
| Margaret Douglas, . | 2 | — | 2 | — | — | — |
| Janet Wood, . | 3 | — | 3 | — | — | — |
| Anne Watson, . | 3 | 1 | 1 | — | — | 1 |
| Jean Angus, . | 1 | — | 1 | — | — | — |
| Euphemia Frazer, . | 3 | 2 | 1 | — | — | — |
| Alexander Carmichael, | 5 | 4 | 1 | — | — | — |
| John Luke, . | 4 | 3 | 1 | — | — | — |
| William Slater, . | 2 | 2 | — | — | — | — |
| John Falkner, . | 3 | 3 | — | — | — | — |
| Samuel Gray, . | 5 | 4 | — | — | — | 1 |
| Simon Frazer, . | 5 | 3 | 2 | — | — | — |
| John Macdonald, . | 3 | 3 | — | — | — | — |
| Jane Brown, . | 4 | 4 | — | — | — | — |
| Neil M'Kechney, . | 6 | 5 | — | — | — | 1 |
| Charles M'Donald, | 5 | 3 | 2 | — | — | — |
| Jane Millar, . | 5 | 4 | 1 | — | — | — |
| John Adams, . | 5 | 1 | 4 | — | — | — |
| John Ferguson, . | 3 | 1 | 2 | — | — | — |
| John Jones, . | 2 | 1 | 1 | — | — | — |
| Peter Macaulay, . | 6 | 5 | 1 | — | — | — |
| William Kyler, . | 4 | 3 | 1 | — | — | — |
| Thomas Hay, . | 6 | 3 | 2 | — | — | 1 |
| Elizabeth Kelly, . | 1 | — | 1 | — | — | — |
| Marjory Duffy, . | 3 | 2 | 1 | — | — | — |
| James Duffy, . | 4 | 2 | 1 | — | — | 1 |
| Anne Carline, . | 3 | 1 | 1 | — | — | 1 |
| Mary Brown, . | 1 | — | 1 | — | — | — |
| Mary Flin, . | 6 | — | 6 | — | — | — |
| Thomas Collins, . | 3 | — | 3 | — | — | — |
| John Victory, . | 3 | — | 2 | — | — | 1 |
| Torrance Flin, . | 5 | 3 | 2 | — | — | — |
| Robert Meldrum, . | 5 | — | 4 | — | — | 1 |
| James Gartland, . | 5 | 2 | 3 | — | — | — |
| Peter Branagan, . | 5 | 4 | 1 | — | — | — |
| Widow Mackay, . | 1 | — | 1 | — | — | — |
| Mary Smith, . | 2 | 1 | 1 | — | — | — |
| Johnstone Kerr, . | 2 | — | 1 | — | — | 1 |
| Peter Macgregor, . | 5 | — | 5 | — | — | — |
| Rosa Fowler, . | 1 | — | 1 | — | — | — |
| Betty Kelly, . | 3 | — | — | — | — | 3 |
| Samuel Cockburn, | 8 | 2 | 6 | — | — | — |
| Charles Plifford, . | 3 | — | — | — | — | 3 |
| James Queen, . | 4 | 2 | 2 | — | — | — |
|  | 188 | 94 | 72 | 2 | 0 | 22 |

| Names of Heads of Families. | No. of Family. | No. Vac. | No. had S.-Pox. | S.-Pox after Vaccin. | S.-Pox after S.-Pox | No. Unprotected. |
|---|---|---|---|---|---|---|
| Brought forward, | 188 | 94 | 72 | 2 | 0 | 22 |
| John Dinnon, . | 3 | 1 | 2 | — | — | — |
| Michael Maclaren, | 6 | 1 | 5 | — | — | — |
| John Cosgrove, . | 5 | 3 | 2 | — | 1 | — |
| Isabella Crosby, . | 1 | 1 | — | — | — | — |
| James Macguire, . | 4 | 1 | 3 | — | — | — |
| Helen Donelly, . | 1 | — | 1 | — | — | — |
| Andrew Nasmyth, . | 2 | 2 | — | — | — | — |
| Janet Drummond, | 1 | 1 | — | — | — | — |
| John Tyac, . | 5 | 1 | 4 | — | — | — |
| Michael Kelly, . | 3 | — | 3 | — | — | — |
| Christian Wright, | 2 | 1 | 1 | — | — | — |
| William Evans, . | 4 | 2 | 1 | — | — | 1 |
| Andrew Dowie, . | 3 | 1 | 2 | — | — | — |
| Margaret Hamilton, | 2 | 2 | — | — | — | — |
| Isabella Donaldson, | 1 | — | 1 | — | — | — |
| James Kelly, . | 7 | 2 | 4 | — | — | 1 |
| Janet M'Queen, . | 1 | — | 1 | — | — | — |
| Sophia Stewart, . | 1 | — | 1 | — | — | — |
| Helen Macleod, . | 1 | 1 | — | 1 | — | — |
| Helen Millar, . | 2 | 2 | — | — | — | — |
| Eliza Bense, . | 1 | — | 1 | — | — | — |
| Total, | 244 | 116 | 104 | 3 | 1 | 24 |

From this table it appears that, of 244 individuals (members of 73 families) residing in the same parish in Edinburgh, only 116, *or less than the half, were vaccinated;* that 104 had already taken small-pox, and 24 were still liable to an attack thereof, being unprotected by vaccination, or by having had the natural small-pox.

The only other similar fact with which I am acquainted, as showing on a limited scale the actual proportion of vaccinated individuals among the poorer classes of this country, is that one published by Mr Marshall relative to the parish of Chelsea.* From his statement it appears, that 45 families applied for parochial medical relief between June 1838 and June 1839, on account of small-pox being among them. These 45 families yielded a total of 264 individuals, and *of these* 81 *only were vaccinated;* 30 died from small-pox in these families—27 of these with the natural small-pox, and 3 under a second attack of that virulent disease. No deaths occurred among the vaccinated.

Now, although it may be objected to Mr Marshall's statement, that it cannot fairly represent the state of the poorer classes in England, seeing that it applies simply to those who applied for medical relief when actually labouring under small-pox, the same cannot hold with regard to the table which I have given above. The above table shows the actual state of a considerable section of the population of the Old Greyfriars parish, enumerating every family in that section; and from personal inquiries in other parts of Edinburgh, I am satisfied that the lower classes in most parts of the city are in very nearly the same proportional state as to vaccination.

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* Lancet, 1838–39, p. 854.

Seeing, then, that less than the half of our lower classes are not protected by vaccination from the ravages of small-pox, and seeing that this table, as well as the statistics of recruiting, demonstrates that almost all who are not so protected take that disease, need it surprise us that small-pox should continue its ravages among us? From the above table we see that, in every 100 individuals, 48 (strictly 47.54) only were vaccinated, 42 (42.21) had small-pox, and 10 (9.85) were ready to take it as soon as exposed to its contagion. Seeing, then, that this is the case, we can easily explain the continued prevalence and fatality of that loathsome disease among us. We see that 10 of every 100 of the lower classes are liable to take small-pox from being neither protected by vaccination nor by having had the natural disease. When, therefore, an epidemic makes its appearance among them, it finds so many subjects on which to wreck its violence, that its virulence increases more and more, until at last it acquires that intensity that it extends to those protected by vaccination or by having had a previous attack of small-pox itself. We know that almost every epidemic attacks a certain number of those who have been vaccinated, as well as of those who have had the natural or inoculated small-pox; but it is extremely satisfactory to know that far fewer of those die who have been previously vaccinated, than of those who have had a previous attack of small-pox. This subject will be alluded to afterwards.

As the above conclusions, deduced from statistical facts, are new, and put the question of the cause of the prevalence of small-pox in a tangible and authentic form, it may be excusable to put them in the form of a table, so that they may be seen at a glance, and be more easily compared together.

*Table of Proportion of Population vaccinated in different countries.*

| Countries. | Authorities. | Proportions of Vaccinations to 100 of Population. |
|---|---|---|
| Great Britain and Ireland. | Statistics of Recruiting. | 73·0 |
| Chelsea, (England). | Marshall. | 30·6 |
| Edinburgh, (Scotland). | Stark. | 47·5 |
| Austria, 1833. | Austrian Governm. Reports. | 67·5 |
| France, 1806–26. | Villermé. | 64·0 |
| France, 1843. | French Governm. Reports. | 60·1 |
| Marseilles. | Bousquet. | 75·0 |
| Sweden, 1816–35. | Registrar-General's Report. | 69·2 |
| Ceylon, 1802–34. | Kinnis.[*] | 36·4 |

From this tabular view of the facts which are above stated relative to the proportions vaccinated and unvaccinated in different countries, we see that vaccination is much more neglected than it ought to be, or than it ever has been believed to be. In our country, (which especially concerns us,) the statistics of recruiting show us that over the kingdom more than a third of the lower classes of the population are unprotected by vaccination; the Edinburgh table allows us to infer that in Edinburgh more than a half are unvaccinated; and the Chelsea tables prove that fully two-thirds of the lower classes in England have never been subjected to vaccination. Even estimating the number vaccinated at the very highest, we find that it does not exceed two-thirds of the population. With such a state of the population we need not be surprised that England and Wales should lose their ten or sixteen thousand annually from small-pox, Ireland its six thousand, and Scotland its one or two thousand. Indeed with such a state of the population, the wonder is that small-pox is not a more fatal malady. Seeing, however, that such is the probable state of our population with regard to vaccination,—seeing that almost all who are not vaccinated are sure sooner or later to be attacked with small-pox, it becomes the interest not only of an enlightened government, but of every individual of all classes of the community, to exert themselves to extend the benefits of vaccination to every subject of the realm. Should a virulent epidemic of small-pox break out among the lower classes who are in the above state with regard to vaccination, it would soon extend its ravages to many of the higher classes, and to not a few of those protected by vaccination itself. It is therefore the personal interest of all to urge on the lower classes to avail themselves of the benefits of vaccination; and were this done as effectually as it is in the army, we should soon see the small-pox completely banished from these islands. To the disgrace of Scotland the vaccination act has not yet been extended to it. And if we find that act has already done unquestionable good to Ireland and England in increasing the number of vaccinations and diminishing or putting an end to the pernicious custom of small-pox inoculation, which constantly keeps up the disease among the people, as well as carries off more than are lost from an attack of small-pox after vaccination, it cannot be doubted that its extension to Scotland would go far to save many a valuable life to our queen and country.

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[*] This allows the half of those recorded as vaccinated between 1802 and 1834 to have been alive in 1834, and does not include the unvaccinated population of the kingdom of Kandy, which would reduce the proportion vaccinated nearly a half lower.

There seems, however, to be one thing mainly defective in the Vaccine Act, which will most unquestionably prevent it from improving in any material degree the condition of our population relative to increasing the numbers vaccinated. The whole real good it has done or can do, in its present state, is the rendering penal the practice of small-pox inoculation. Merely allowing the Poor Law Guardians to contract for vaccinating the paupers will never have the effect of increasing the number of vaccinations over the country; nor will even this contract for vaccinating the paupers reach the thousands who, as much as the poor themselves, require to have the advantages of vaccination pressed upon them. The correctness of this opinion is evidenced by the numbers cut off by small-pox even in London itself during the last year—four years after the act was passed—no fewer than 1804 having died of that loathsome disease, very nearly as many as before vaccination was introduced.

Every one who reflects on the subject, but especially on the statistical facts brought forward for the first time in this paper as to the state of our population with respect to vaccination, must be convinced that some more efficient measures must be used in order to secure the people from the ravages of small-pox. This could only be done efficiently by passing an act obliging every medical practitioner, or midwife who attends the birth of a child, to see that child vaccinated, or give a satisfactory reason, such as the refusal of the parents, for its non-performance. In order to carry such a measure into effect it would be necessary to have a salaried officer under Government, to whom regular monthly, quarterly, or half-yearly returns should be directed to be made from all such practitioners and midwives, under a severe penalty; and this Government officer should be bound to return to the Secretary of State for the Home Department, and publish annually a list of the numbers of births and vaccinations, with such other particulars as might be desirable. This officer should also be director or superintendant of a central Vaccine establishment in the metropolis, where a constant supply of vaccine virus should be kept up, and transmitted to applicants in all parts of the kingdom. Three such officers would be required, and three such central Vaccine establishments—one in London, one in Dublin, and one in Edinburgh; and if we reflect that such means would undoubtedly have the effect of efficiently propagating the benefits of vaccination, and consequently producing an annual saving of from 15,000 to 20,000 lives, all will admit that an annual grant of L.5000 or L.6000, which would probably cover the expenses of such establishments, would be well bestowed.

Having thus, I hope, satisfactorily proved that the continued prevalence and fatality of small-pox, not only in our own country, but over all the kingdoms of Europe, is owing to the neglect of vaccination, it only remains shortly to show that

*4thly, Vaccination affords as perfect a protection from small-pox as it is possible to obtain,—as perfect immunity from danger as if the person had once passed through the natural small-pox.* When vaccination was first introduced into practice, Doctors Jenner, Pearson, Woodville, and others, inoculated with small-pox matter the persons who had been vaccinated, in order to test the efficacy of the antivariolous powers of the vaccine virus. Among all the persons thus treated not a single instance occurred of the person who was previously vaccinated taking the small-pox; and the numbers with whom this severe test of the protective powers of vaccination was tried may be judged of by the fact, that by 1800, upwards of 6000 had been inoculated with small-pox after a previous vaccination, and all had resisted that disease.

Even the opponents of vaccination, however, are forced to allow that these are incontrovertible facts; but they assert that vaccination is not *now* that efficacious preservative which these experiments prove it *then* to have been. In fact, they demand for vaccination what a previous attack of small-pox does not even procure,—viz. complete exemption ever after from a subsequent attack of small-pox. I shall therefore very shortly show that a second attack of small-pox is not an uncommon occurrence, and that it is then a comparatively fatal malady, certainly more so than an attack of small-pox after vaccination. The "Report of the Section of the Provincial Medical and Surgical Association appointed to inquire into the present state of Vaccination," renders it abundantly evident that a second attack of small-pox is far from being of rare occurrence. Thus Mr Crosse of Norwich reported that of 603 cases of small-pox which had been witnessed by him in that town during the course of his practice, no fewer than 297 had previously had small-pox, while only 91 had been previously vaccinated. The Vaccine Section state that their correspondents relate the occurrence of no fewer than 239 cases of small-pox after small-pox, of which 12 or 13 died. Mr Goolden, in a practice of forty years, has seen about 90 cases of second attacks of small-pox, of which 4 died; and he was acquainted with two families who had small-pox three times. Dr Thomson of Edinburgh met with 41 cases of a second attack of small-pox, and 30 similar cases were communicated by a friend;—of this number 3 died. 310 cases occurred after reputed vaccination, but of this number only 1 died; but it was not ascertained whether the disease was true small-pox or chicken-pox.

M. Bousquet states, that in Marseilles during the year 1825, out of a population of 40,000, about 2000 had previously had small-pox; yet of this number 20 were attacked the second time with that disease, and 4 died. The deaths were therefore in the proportion of 20 out of every 100 attacked, or 1 out of every 500 of those who had previously had small-pox. In the same population 30,000 were vaccinated, and of this number 2000 took small-pox, or modified small-pox, (varioloid); of these only 20 died, or in the proportion of 1 out of every 100 attacked, or 1 out of every 1500 vaccinated. This fact then shows the infinite superiority of vaccination to a previous attack of small-pox in affording safety and protection from danger to life under a subsequent attack of small-pox, for while 1 out of every 5 died who had previously had small-pox, only 1 out of every 100 died who had been vaccinated.

In the Royal Military Asylum at Chelsea* there occurred, from 1803 to 1833, no fewer than 26 cases of small-pox after small-pox among the children in that institution; but only 24 cases of small-pox after vaccination. The superior protection to life which vaccination afforded over the natural small-pox was shown in the fact, that while not one child died who had been previously vaccinated, no fewer than three died under the second attack of small-pox.

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* Provincial Med. and Surg. Association Trans. vol. viii. 1840.

Not to multiply instances, M. Heim, in his account of the epidemic small-pox in Wurtemburg, from 1831 to 1836, states that 39 who had previously had small-pox took the disease a second time, and of these 14 died, or 35·8 of every 100 attacked; 147 who had perfect vaccine cicatrices were attacked, and of these 42 died, or 28·5 out of every 100 attacked.

And lastly, Dr Gregory, of the Small-pox Hospital, London, shows by the statement of the state of the patients relative to vaccination admitted into that hospital, that while those who had previously had small-pox died in the proportion of 22·2 out of every 100, those who had been previously vaccinated only died in the small proportion of 5·8 out of every 100. These facts will be rendered more distinct by embodying them in the following table.

*Table showing the comparative Mortality of Small-pox after Small-pox, and Small-pox after Vaccination.*

| Authorities. | Small-pox after Small-pox. | | | Small-pox after Vaccination | | |
|---|---|---|---|---|---|---|
| | No. of cases. | Deaths | Propor. of deaths to 100 cases. | No. of cases. | Deaths | Propor. of deaths to 100 cases. |
| Thomson, Edinburgh, | 71 | 3 | 4·2 | 310 | 1 | 0·3 |
| Chelsea Milit. Asylum, | 26 | 3 | 11·5 | 24 | 0 | 0·0 |
| Heim, Wurtemberg, | 39 | 14 | 35·8 | 147 | 42 | 28·5 |
| Bousquet, Marseilles, | 20 | 4 | 20·0 | 2000 | 20 | 1·0 |
| Gregory, London, | 9 | 2 | 22·2 | 789 | 46 | 5·8 |
| Total, | 165 | 26 | 15·7 | 3270 | 109 | 3·3 |

From this table, then, it will be apparent that while those who take small-pox for the second time die in the proportion of 15·7 out of every 100, those who take small-pox after vaccination only die in the small proportion of 3·3 out of every 100—a proportion absolutely lower than the mortality of almost any other, even the mildest disease.

The above instances may suffice to prove that a second attack of small-pox is not a very uncommon occurrence, as well as that when it does occur it is a much more fatal malady than an attack of small-pox after vaccination. I have myself attended a few cases of second attacks of small-pox, as well as cases of small-pox after vaccination; but, as all recovered, the narration of these cases would not throw any additional light on the points under discussion.

Before leaving this subject, one circumstance may be alluded to which has come out of late years, since the alarms excited relative to the supposed inefficacy of vaccination have come under notice. The Prussian, Hanoverian, and some other continental governments, taking alarm at the spread of small-pox among their subjects, and mistaking, as I firmly believe, the true cause, commanded their standing armies to be revaccinated. According to the official report[*] relative to the "Revaccinations in the Hanoverian army for the years 1837-8, and 9," it appears that revaccination succeeded only in 11 per cent., and was only partially successful in 27 per cent.,—completely failing in 62 out of every 100. It so happened that in the army there were a certain number of men, who, instead of being vaccinated, had had small-pox. They likewise were subjected to the general vaccination; and, as if nature wished to prove to disbelieving man that being *once* vaccinated, or having *once* had small-pox were identical in preventing a subsequent attack of small-pox, vaccination succeeded with them in the same proportions as with those who had been previously vaccinated.

M. Heim, also, in his "Historical and Critical Review of the Small-pox Epidemics, &c. in the Kingdom of Wurtemberg," states that individuals may be vaccinated in the very same proportions after small-pox as after vaccination; and in proof he gives the following proportional table deduced from his own observations, and from the actual results furnished by re-vaccinations in the Wurtemburg army.

Of 100 vaccinated after small-pox, 32 succeeded, 26 were modified, 42 failed.
Of 100 vaccinated a second time, 34 succeeded, 25 were modified, 41 failed.

As the physical constitution of men, and of course their liability to disease, vary in inhabitants of different countries, the only fair way of judging of the comparative protection offered by a first attack of small-pox and by vaccination, is by comparing the results furnished by inhabitants of the same country. Thus though unfair to compare the results of revaccinations in Wurtemberg with that of vaccinating small-pox subjects in Hanover, it is strictly correct to compare the results of revaccination with those of vaccinating small-pox subjects in the same country. And when we find that both at Wurtemberg and at Hanover the same ratio of proportion was maintained, we must also from this conclude that vaccination gives as perfect immunity from a subsequent attack of small-pox, as if the person had once passed through the small-pox itself. More than this we can never ask—more than this we can never obtain. If the protective powers of vaccination wear out of the system after a certain number of years, which I most unhesitatingly deny, so do those of an attack of small-pox itself. And if theorists imagine and endeavour to prove that a person ought to be revaccinated every twelve or twenty years, I hold it just as equally necessary that the person who has had small-pox be, after the same space of time, again subjected to that disease by means of inoculation, that he may not fall a victim to the disease, should he take it for the second time naturally. The latter proposition is so preposterous that I cannot imagine any one so obtuse as not to see its absurdity. And if it be so, certainly not less so is the proposal to revaccinate.

In conclusion, then, it may be remarked that the above facts establish that the existing prevalence and mortality of small-pox is not owing to any failure in the protective powers of the vaccine virus, nor to its wearing out of the system after a certain number of years, but to the neglect of vaccination altogether; and that vaccination affords a greater protection from a fatal termination, should the individual be subsequently attacked with small-pox, than if he had passed through the natural or inoculated small-pox themselves. It is highly desirable that attention should be paid to the facts above stated and to the conclusions drawn from them. From not being aware of these facts, many eminent physicians have by their writings, done much harm by inducing doubts as to the protective powers of the vaccine virus; and as the public at large are very apt to discard altogether what they see learned men regard as only a temporary or doubtful preservative, perhaps no inconsiderable number of the cases of neglect of vaccination may be attributed to their writings being propagated among the public at large. Indeed I firmly believe that all the crude theoretical speculations relative to the supposed inefficacy of vaccination, as a preservative against small-pox, or its supposed wearing out of the system after a certain number of years, arise from ignorance of those very important statistical facts which I have collected together in this paper.

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[*] Hanoverische Annalen, Heft ii. 1840.

*21 Heriot Row,*
*4th March* 1845.

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## ART. VII.—*On the Period of Puberty in Hindu Women.*

By JOHN ROBERTON, Manchester.

IN common language, Hindostan, the land of the Hindus, is India north of the Vindya mountains, or, less exactly, of the river Nerbudda, (along which this mountain chain runs in about latitude 22° north,) consisting of the basin of the Indus, that of the Ganges, the desert towards the Indus, and the high tract called Central India. All to the south is the Deckan. By the Hindus are meant a people who "speak dialects essentially allied to the Sanskrit, and through it to the great Indo-European family of languages."* Their proper country is as above defined, but they have pushed their colonies towards the north and the south; and they form a part of the population of the Himalayan border, as well as of many countries in the Deckan, where they meet and mingle with the Tamulian race.

Until the time of Bishop Heber, it was usual to talk of the Hindus as one people, just as we speak of the Irish or the Portuguese, instead of as forming, what is truly the case, many nations;

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* Prichard's Researches into the Physical History of Mankind, Vol. iv. page 97. See also the beautiful ethnological map of Asia, in the same volume.

differing amongst themselves fully as much as the people of different countries in Europe. The inhabitants of the dry countries in the north, which, in winter, are cold, are comparatively manly and active; the Marattas, inhabiting mountainous and comparatively unfertile regions, are hardy and laborious; while the Bengalese, with a moist climate, and their double crops of rice, where the cocoa-nut tree and the bamboo furnish all the materials for construction unwrought, are more effeminate than any other people in India. But love of repose, though not sufficient to extinguish industry, or repress occasional exertions, may be taken as a characteristic of the whole people.*

But even if we confine ourselves to the presidency of Bengal, which, in the number of its inhabitants, far surpasses the most populous European kingdom, we shall find a vast and varied territory, possessing almost every variety of situation, soil, and climate. The Bengal presidency alone in extent of surface more than equals half Europe, and contains a population of not less (probably considerably more) than seventy-five millions, divided into nations as different from each other as Italy, Spain, Portugal, France, England, the Scotch Highlands, Scandinavia, Germany, and Switzerland. The presidency of Madras, and Bombay, and Central India exhibit another list of nations who answer to our Hungarians, Greeks, Poles, Prussians, and various tribes of the Russians. Yet all this is forgotten, or perhaps unknown to most of us, when we speak or write of the people of India.†

The Hindus, again, are divided into castes and sects as various as our Episcopalians, Presbyterians, Independents, Methodists, Baptists, Quakers, and numerous others. There is hardly a district in which there does not exist some caste or sect which is hardly known in the neighbouring one, and the tenor of their different religious views has also considerable effect upon their moral and social conduct. It has been shrewdly remarked concerning Mr Ward's elaborate and very learned "Account of the Hindus,"‡ that had it been entitled "An Account of the Bengalee Hindus derived from Observations in the Neighbourhood of Sirampoor," it might have been correct enough, but to publish the work as a description of the Hindus in general, as its title would imply, was as unfair as it would be in a Hindu who, after residing some years at Naples, should give the result of his observations there as "An Account of the Christians." As far as relates to the Neapolitan Christians, there might be no fault to find; but the French, Germans, English, and Spanish would hardly allow that the work contained a true delineation of their manners, customs, opinions, and conduct.

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* The History of India by the Honourable Mountstuart Elphinstone. London, 1841, Vol. i. p. 371. One of the most valuable works on India. I am informed by those who have resided long in the East, that no writer possesses a more accurate knowledge of the races of Hindustan, or evinces a fairer spirit in the treatment of that much contested subject,—the social and moral character of the Hindus.

† See Notes on Indian Affairs by the Hon. Frederick John Shore, Judge of the Civil Court and Criminal Sessions of the District of Furrukhabad. London, 1837, Vol. i. page 515. In the slight sketch given in this paper of the physical and social condition of the Hindus, I have leant chiefly on the weighty authority and ample experience of this writer and of Mr Elphinstone.

‡ Ward's Account of the History, Literature, and Religion of the Hindus, 4 vols. 1817–20.

The physical characters of the different Hindu nations, as might be expected, present considerable varieties. The Hindostanis on the Ganges above Bengal are the tallest, fairest, most warlike, and manly; while the Bengalese, though good looking, are small, black, and effeminate in appearance; remarkable for timidity and superstition, as well as for subtlety and art. Many of the higher orders, especially in the northern provinces, are handsome in their features, having an oval face, and a nose nearly aquiline. Some again are comparatively fair, and others quite black; but a dark-brown complexion is most common, black eyes and hair. In Bengal the greatest number are below the middle stature, very slender in body, and generally inferior to Europeans in muscular strength.

It is a mistake to imagine that the Hindus live on rice. The principal food of the people of Central India is wheat; and in the Deckan seeds called jowár and bájra, the former common throughout the Levant under the name of durra. Rice, as a general article of subsistence, is confined to Bengal and part of Bahar, with the low country along the sea all round the coast of the Peninsula. In most parts of India, besidès, it is only used as a luxury. In the southern part of the Deckan, the body of the people live on a small and poor grain called ragi.

No less erroneous is it to represent the Hindus as living solely on grains and fruits. The majority of the inhabitants of Bengal and Orissa, it is true, do not eat meat, yet almost all of whatever caste have no dislike to fish. There is much singularity and appearance of caprice in regard to the different kinds of animal food consumed in different parts. Thus, in Kumaon they will eat the short-tailed sheep of the hills but not the long-tailed breed. Many of the highest Rajpoots and Brahmins in Northern and Western India will eat venison, goat's and wild hog's flesh, while they shun that of sheep and domestic swine. Others, again, will eat the jungle fowl who would think the touch of a domestic fowl pollution. As a general fact, however, it may be stated that the food of the common people both in the country and in towns is unleavened bread, with boiled vegetables, clarified butter or oil, and spices.*

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* Elphinstone's History, Vol. i. p. 331.

Women anciently appear to have been more reserved and retired than they are in this part of the world; but the complete seclusion of them would seem to have come in with the Mahommedans, and it is even now confined to the military classes. The Brahmins do not observe it at all. Women, however, do not join in the society of men, are not admitted to an equality with them, do not eat with them, nor walk with them; the woman always follows the man, even when there is no obstacle to their walking abreast.

As a general rule, the Hindu women do not learn to read. Against educating them there appears to exist a strong and deep prejudice, owing to a belief that, however proper an accomplishment reading and writing may be for dancing girls, (who commonly possess some education,) it is neither desirable nor decorous in women of respectable character.

By the code of Menu, a girl might be married at eight, and if her father failed to give her a husband for three years after she was marriageable, she was at liberty to choose one for herself. The same infantile age for marriage still obtains. The bride must always be under the age of puberty, and both bridegroom and bride are usually under ten. This may be called the first marriage. There is a second ceremony, when consummation takes place, which happens as soon as ever the female reaches the age of puberty. This custom of early marriage amongst the Hindus is remarked in the earliest historical notices we possess of them by European writers. Indeed, amidst the great diversity of traits which may be observed in the manners of different Hindu tribes and nations, I am not aware that there is any exception to the universal prevalence of infantile marriage, and of consummation of the marriage at the latest on the arrival of the age of puberty.

In pursuing my inquiries concerning the alleged influence of climate in different regions of the earth in determining the earlier or later occurrence of female puberty, I naturally directed my attention to the natives of our own imperial possessions in India, but for years without any fruit; those to whom I applied assuring me that it was difficult or impossible for a European to obtain information of this nature. I then bethought me of the Christian missionaries, of such especially as had resided many years in India, and who might be supposed to have access, through the mistresses of mission female schools and in other ways, to the desired information. Hitherto, however, although my applications have been numerous, and supported by influence emanating from the directors of several of the missionary societies, my success in this particular direction has been extremely limited. Nevertheless, I have still hopes of receiving communications in the course of the present year.

Last spring I was advised to apply to an accomplished missionary who had been for many years in Madras, and was lately returned in ill-health to England, on the ground that he would probably soon go back to Madras; and that he was very likely, from his philosophical taste and enlightened curiosity, to undertake inquiries for me. The following is this gentleman's reply, dated Malvern, 15th April 1844. I withhold the name, not having obtained permission to publish it.

"If I had been on the point of returning to India, I should have had much satisfaction in collecting as I might have been able the information you desire. As it is, I will send your letters to some medical friends, who will, I hope, take the pains to make the needful inquiries. My opinion is that Indian facts will fully confirm your theory. I should say the average at which puberty commences is fourteen years. They have a custom in India (very disgusting to an English mind) of marking this event in a girl's history in the most public manner. The poorer classes wear flowers in the hair at the back of the head; the richer give a feast on the occasion; and, if the girl has been betrothed, she then goes to live at the bridegroom's house, and the marriage is consummated. In general, all young persons are then considered marriageable, and are married as soon after as possible. The average age of the girls whom I have thus seen walking about, I should say was fourteen years. I remember a case in which marriage could not take place, as I was told by the father of the young man, (for the Hindus make no scruple in speaking on these subjects,) because puberty had not commenced in the girl, who was, I should say, fifteen years old. The cause to which it was attributed by him was poverty of living. This is the amount of my present information on the subject, which I send you in the meantime. I trust the letters to India will bring you exact and detailed information of facts.—I remain," &c.

Before commenting on this and on other communications which are to follow, I ought to remind the reader what the prevailing opinion in Europe is, concerning the age of puberty in the East, that he may be able to judge how far the opinion referred to is supported or refuted by the facts adduced. According to Baron Haller, whose view has been implicitly and universally adopted and followed ever since he wrote, "In the warm regions of Asia the menses appear from the eighth to the tenth year; in Switzerland, Britain, and other equally temperate regions, at the age of twelve or thirteen; and later the farther we ascend towards the north."*

It will be seen from the above letter, that, with these assertions of Haller, the experience of this missionary (who, I understand, has been in India nearly twenty years,) does not coincide. He does not, it is true, profess to state a fact, but to give merely an impression when he writes, " I should say the average age when puberty commences is fourteen years ;" an impression it is, however, derived from long and familiar observation.

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* Elementa Physiol., Tom. vij. Pars ij. p. 140.

The custom of Hindu girls wearing flowers in the hair, indicative of the occurrence of puberty, seems to prove, if the sign is to be depended upon and is general, that the investigation of this point of physiology in Hindostan is not surrounded with those formidable difficulties that have been alleged.

Encouraged by the receipt of this letter, I persevered in my applications to missionaries in various parts of India. Only a single reply has as yet reached me, and this comes from the Rev. J. Wenger of the Baptist mission, Calcutta. The following is a copy,—

" *Calcutta, September* 14, 1844.

The last mail has safely brought me the letters and the parcel which you had forwarded for me ; and I now proceed to comply with your request as well as I can. I am sorry it is not in my power to give you all the information you wish to obtain, nor even to put that little which I can supply into the form which you have suggested. All I can do is to mention some facts which, I believe, can be fully relied upon, and which, I hope, will not be wholly unacceptable, though contributing but little towards that stock of observations which you will deem it necessary to obtain before you draw any positive theoretical inferences.

I venture to begin with stating, that several years ago, before I came to this country, the missionaries of the Baptist Missionary Society, (I rather think not they alone,) felt the importance of putting an end amongst their converts, whether real or nominal, to the early marriages so prevalent among the natives of India. I need not stop to develop in detail the reasons which render such a measure important to a Christian community. In order to proceed on safe ground, they requested a number of pious and experienced ladies to state what they considered, on physical grounds, the minimum of age when girls were fit to be married. The reply was the *fourteenth* year, and, in consequence of this decision, the rule was adopted, though it could only be gradually introduced in practice,—not to allow any girl to be married before she had reached her fourteenth year. This fact will at once convince you that the ladies referred to must have known that menstruation frequently commenced only towards the end of the thirteenth year.

Another fact is this, that although the heathen girls of this land are usually married with much ceremony at the age of 6, 7, or 8, sometimes later, yet the marriage ceremony is invariably repeated on the first appearance of the menses. Upon the receipt of your letter, I asked my pundit, a Brahmin, at what age this ceremony of re-marrying took place. He naturally replied it was not fixed, but it could not take place, for physical reasons, before the eleventh year; that sometimes it did not take place till the fourteenth; that it was thought a great thing for a Hindu to get all his daughters married under ten, because then there could be no doubt of their virginity, &c. a point of paramount importance to all who wished to keep their caste pure.

These remarks of the pundit suggest the thought that the menses occasionally make their appearance in the eleventh year. And I think this is the case in some rare instances. I am acquainted with a lady, born in this country, (now 32 years old,) of European parents, both of unquestionable piety, who had them in her eleventh year. And, when pastor of a native church, I had to decide upon a case of marriage, with reference to a native girl who was said to be only 11 years old, (which probably meant in her eleventh year,) and yet to be subject to menstruation. On the other hand, I knew a girl in our female school, who appeared to be in her fourteenth year at least, when it came on for the first time, at the close of an illness which threatened to prove fatal. From all I can learn, the menses *usually*, abating some extraordinary cases, make their first appearance in daughters of European and mixed parents in this country about the end of the twelfth year, and in *bona fide* native girls about six months earlier; but, in both cases, very often only in the thirteenth year and later.

In conclusion, I may add, that I know a native woman, now nearly 50 years old, who had her first child either in her thirteenth or fourteenth year, a circumstance which was considered very extraordinary, as so early a confinement is of very rare occurrence.

This, I regret to say, is all the information I am able to supply; and I doubt whether any one in this country will be able to furnish a tabular statement of the kind you have suggested, partly because the Hindus either keep no memoranda of the exact age of their children, or, if they did, would refuse to communicate them to Europeans; and partly because the native churches are of too recent origin, and the system of registering hitherto introduced in them is too limited to afford anything like satisfactory information. This last circumstance applies particularly to Baptist churches, because, owing to the non-baptism of infants, there is no great inconvenience connected with the absence of a registry for births. It is, however, under consideration whether a complete system of registry must not be introduced, not for church purposes exactly, but in order to pave the way for securing to native converts their civil rights, which now they do not possess, and their religious liberty, which they may soon be in danger of losing. I have the honour, &c.

J. Wenger."

This letter, whose value the reader will be better able to appreciate when he has perused the communication from Dr Goodeve, supplies certain facts that are not the less trustworthy and important because they come out incidentally, without reference to the subject of this inquiry. Hindu converts are to be formed into a Christian church; the custom of infantile marriage prevails among them, bringing along with it, as may well be supposed, those hinderances to the development and cultivation of the female mind, and to the honour and happiness of the conjugal state inseparable from so absurd and barbarous a violation of the laws of nature. The practice is to be changed; a prudent course is adopted; it is determined to ascertain what is the minimum age when the Hindu is fit to be married. For this end a jury of matrons, probably the experienced wives of the missionaries, investigate; and their decision is, that, on physical grounds, marriage should not be permitted under the fourteenth year.

Another interesting fact is the reply of Mr Wenger's pundit to a question, the object of which, it is likely, he was not allowed to perceive, viz. at what age the ceremony of re-marrying Hindu girls took place. The Brahmin answers that the period is not fixed, but that, for reasons with respect to bodily maturity, it cannot take place in any until the eleventh year.

Mr Wenger thinks that puberty occurs somewhat earlier than the age asigned by the preceding writer, viz. at twelve; in which, it will be found, he agrees remarkably with Dr Goodeve's table.

Concerning the earliest age of child-bearing in the Hindu, Mr Wenger speaks with decision. One instance in the thirteenth or fourteenth year he had known; but such an event, he remarks, was considered " very extraordinary," as it is of very rare occurrence.

It is to the kindness of my much esteemed friend, Mr J. K. Heron of this town, recently returned from Calcutta, that I am indebted for the following perfectly novel and, I hope they will be considered valuable table and replies to queries, illustrative of the age of puberty in Hindu women, collected and drawn up, at his request, by an eminent physician, Dr Goodeve, Professor of Midwifery in the Medical College, Calcutta. Dr Goodeve's communication is of date January 7, 1845, addressed to Mr Heron, and is left to speak for itself, there being no accompanying explanations or commentary whatever.

## *Professor Goodeve's Table and Replies to Queries.*

| No. of cases. | Present age. | When menstruated. | No. of cases. | Present age. | When menstruated. |
|---|---|---|---|---|---|
| 1 | 25 | 12 yrs. | 46 | 13 | 11 yrs. |
| 2 | 22 | 16 | 47 | 10 | 9* |
| 3 | 30 | 15 | 48 | 15 | 9 |
| 4 | 32 | 14 | 49 | 14 | 10 |
| 5 | 40 | 12 | 50 | 18 | 12 |
| 6 | 28 | 16 | 51 | 15 | 15 |
| 7 | 11 | 11 | 52 | 15 | 11 |
| 8 | 22 | 12 | 53 | 28 | 12 |
| 9 | 14 | 12 | 54 | 17 | 10 |
| 10 | 16 | 12 | 55 | 20 | 13 |
| 11 | 16 | 12 | 56 | 14 | 14 |
| 12 | 13 | 13 | 57 | 21 | 8 |
| 13 | 22 | 15 | 58 | 24 | 10 |
| 14 | 26 | 11 | 59 | 18 | 11 |
| 15 | 13 | 12 | 60 | 14 | 12 |
| 16 | 31 | 13 | 61 | 17 | 9 |
| 17 | 24 | 14 | 62 | 10 | 9† |
| 18 | 20 | 12 | 63 | 20 | 16 |
| 19 | 19 | 12 | 64 | 16 | 11 |
| 20 | 24 | 13 | 65 | 40 | 13 |
| 21 | 32 | 13 | 66 | 25 | 15 |
| 22 | 29 | 14 | 67 | 15 | 11 |
| 23 | 20 | 12 | 68 | 25 | 11 |
| 24 | 19 | 16 | 69 | 22 | 17 |
| 25 | 25 | 12 | 70 | 40 | 12 |
| 26 | 38 | 12 | 71 | 13 | 11 |
| 27 | 37 | 12 | 72 | 20 | 15 |
| 28 | 24 | 11 | 73 | 30 | 18 |
| 29 | 23 | 12 | 74 | 20 | 20‡ |
| 30 | 22 | 12 | 75 | 25 | 11 |
| 31 | 14 | 12 | 76 | 20 | 12 |
| 32 | 29 | 12 | 77 | 17 | 10 |
| 33 | 24 | 12 | 78 | 35 | 15 |
| 34 | 32 | 14 | 79 | 20 | 10 |
| 35 | 28 | 13 | 80 | 18 | 12 |
| 36 | 31 | 13 | 81 | 21 | 12 |
| 37 | 25 | 11 | 82 | 23 | 14 |
| 38 | 18 | 10 | 83 | 20 | 10 |
| 39 | 21 | 11 | 84 | 30 | 16 |
| 40 | 40 | 10 | 85 | 45 | 15 |
| 41 | 20 | 12 | 86 | 30 | 10 |
| 42 | 26 | 13 | 87 | 26 | 14 |
| 43 | 15 | 11 | 88 | 20 | 9 |
| 44 | 32 | 14 | 89 | 50 | 11 |
| 45 | 18 | 12 | 90 | 18 | 11 |

Ans. to Query 1. The earliest age at which I have KNOWN a Hindu woman bear a child is ten years, but I have *heard* of one at NINE.

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* Impregnated at ten years, safe.

† Was impregnated in the tenth year; died of impeded labour, metritis.

‡ No menstruation. Healthy.

Query 2. The most advanced age at which I have personally known a Hindu woman bear a child is 40.

3. A large portion of Hindu women have children before they are 15 years of age.

4. The ordinary age at which, in Bengal, women commence menstruation is 12 years.

5. I have known menstruation continue to the age of 50 at least, and I believe * * * in one case beginning at 11.

W. H. Goodeve, M. D.,
Professor of Midwifery, &c.
Medical College, Calcutta.

The ninety instances in the table are here drawn up to compare with a table for England, consisting of 2169 instances, collected by Dr Robert Lee, Professor Murphy, and myself.†

| Years of age. | English.<br>When menstruation took place | Hindu.<br>When menstruation took place. |
|---|---|---|
| 8 | — | 1 |
| 9 | 14 | 5 |
| 10 | 55 | 9 |
| 11 | 77 | 16 |
| 12 | 142 | 27 |
| 13 | 263 | 9 |
| 14 | 396 | 8 |
| 15 | 417 | 7 |
| 16 | 340 | 5 |
| 17 | 215 | 1 |
| 18 | 138 | 1 |
| 19 | 65 | — |
| 20 | 33 | 1 |
| 21 | 9 | — |
| 22 | 4 | — |
| 23 | 1 | — |
|  | 2169 | 90 |

From these tables I find that the average age in England for the commencement of menstruation, deduced, it will be seen, from ample data, is 14 years, and the average age for Calcutta, deduced from ninety instances, is 12 years and 4 months; showing a difference of twenty months. In other words, assuming that the data in Dr Goodeve's table are enough to warrant a conclusion, —Hindu women reach puberty *on the average* twenty months earlier than the women of England.

Of course the number of instances from Hindustan will have to be increased manifold before a final satisfactory conclusion can be arrived at as to what is really the average age of female puberty. The data for England are now perhaps sufficient; those for Hindustan have had a fortunate beginning, and in a short time we may hope will be augmented by the zeal of other contributors. Probably the eminent professor to whom I am indebted for so valuable a communication will yet add to the body of facts he has supplied. I am not without hope that such may be the case.

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* A word occurs here in the manuscript the meaning of which I have failed to make out.

† See Dublin Journal, No. lxxvii. p. 178, 1845.

Some of the inferences to be drawn from Dr Goodeve's table and answers, and the letters of the missionaries, may be stated thus:

*1st.* That the view of Haller, namely, that female puberty in the warm regions of Asia occurs from the eighth to the tenth year, is not only erroneous but wide of the truth.

*2d.* That the age for the earliest commencement of menstruation either in Bengal or England is *nine* years. The single case at *eight* in Dr Goodeve's table might easily be paralleled in this country. An instance of the kind came under my own notice in the course of last year.

*3d.* That hence, although the *average* age of puberty, according to Dr Goodeve and Mr Wenger, is earlier in Calcutta than it is in this country, puberty does not actually appear at an earlier period of life in the one country than the other.

*4th.* That the remarkable difference between the tables consists in the far greater proportion of Hindus who arrive at puberty at the age of twelve.

To put this fact in as clear a light as may be, I have to observe that in England and the other European countries where tables of the ages of puberty have been collected, it has not been found that a large proportion of instances cluster at any particular year of age. On the contrary, the occurrence of the sign of puberty is distributed, (as may be seen in those tables,) over a number of years, but pretty equally in the 12th, 13th, 14th, 15th, and 16th years. Out of 2169 English cases only one in about fourteen begins to menstruate at the age of 12, whereas in Dr Goodeve's table, nearly one in *three* begins at that age. May not the age at which marriage was consummated have been given by some of the Hindu women in place of the age when the menses first appeared? I put this query without, however, feeling sure that it deserves any weight.

*5th.* That should it ultimately appear, from a sufficiently ample body of facts, that Hindu women reach the age of puberty earlier *on the average* than happens in Europe, this will be no conclusive evidence that the influence of climate is the cause. Jamaica, Antigua,* Barbadoes, and Grenada,† are farther south, and have a higher mean annual temperature than Calcutta, and yet the facts derived from these islands show that the age of puberty, in blacks and whites alike, is no earlier than in England. Upon this subject I will not now stay to enlarge, because I trust, in the course of a few months, to be in possession of the results of inquiries made in Surinam, British Guiana, and the West Indies, which will probably suffice to settle so much of this question as respects the alleged influence of climate in hastening or retarding puberty.

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* See "On the Period of Puberty in Negro Women," in this Journal, No. 152, 1842.

† Dr Robert Lee, in Lond. Med. Gazette, vol. xxxi. p. 162.

If a difference of this nature exists between the European and the Hindu, it must probably be sought in race. When it is recollected that the consummation of marriage among the Hindus has taken place, at the latest on the arrival of puberty, during the lapse of more than three thousand years, and that the practice is sanctioned by ancient laws and consecrated by custom, it is easy to conceive that those females who were the latest in reaching puberty would be the least sought after for wives—that such women would not unlikely, in many instances, remain unmarried; and that thus, (owing to the origination of a preference on this ground in the selection of wives, operating through a long period of time,) Hindu women would gradually come to consist, in a proportion different from that in Europe, of such as by constitution are early nubile. To me there seems nothing extravagant or far-fetched in this supposition. The production of a like state of things in England, in any particular district, is quite conceivable. Nothing is better established than that early puberty is a family peculiarity. Let us then only suppose families possessing this kind of constitution to intermarry, and the peculiarity in question would be propagated, extended, and transmitted, and so a race distinguished by it would be produced.

*6th.* That the very infantile age at which child-bearing has been known to occur in Hindustan, namely, ten years, is not to be wondered at, considering the odious practice of premature sexual intercourse, the consequence of early marriage. Did the same obtain to an equal extent in England the like consequence (well-known facts warrant us in concluding) would unquestionably, to some extent at least, ensue. Mr Wenger remarks that the birth of a child, even at 14 and 15 years, is a rare occurrence in Bengal. This, however, is not borne out by Dr Goodeve, who affirms that a large portion of Hindu women give birth to a child before they are fifteen. That the latter is the more corect account there can be little doubt; for such a result must follow, of course, where marriage is universally consummated at puberty or even there is reason to infer, in many cases earlier.

Dr Goodeve states that he has known menstruation in the Hindu continue to the age of fifty. Upon this point our information as yet is extremely limited. It would be nearly as important (for the determination of the question as to the age of puberty) that a full table of the ages, when mestruation ceases, should be procured, as it would be to obtain more data respecting the ages when it begins, for if it should appear that Hindus menstruate, on the average, to as advanced a period as occurs in Europe, it would afford strong presumption in favour of there being no difference as to the age when this function commences. Moreover, facts regarding the ages when menstruation terminates are readily obtained, and their accuracy is generally more to be relied on than those which have reference to puberty.

If this inquiry answered no other purpose than to prove how little we know as yet of the physiological, social, and moral condition of our fellow subjects in the East, it would not be altogether in vain. Our empire embraces every variety of climate and of race to be found on the globe. Besides the ruling race at home and scattered through the colonies, there are the Esquimaux of Labrador and Hudson's Bay, the Indians north and west of Canada, the negroes in the West Indies, British Guiana, the Mauritius, and in the colonies on the western coast of Africa; the Hottentots and Kafers of South Africa, the New Zealanders, the Native Australians, the Chinese in several settlements, the Malays of Malacca, the Burmese of Arracan, the Singalhese of Ceylon, the Arabs, Hindus, Tamuls, and numerous other nations of continental India, the Greeks of the Ionian Republic, and the Maltese; and yet, with the exception of the Esquimaux, (of whom we have learned a great deal from the scientific men entrusted with the Arctic voyages and journeys,) what know we comparatively, in regard to the above particulars, of most of these races of people? Little, with that fulness and accuracy of knowledge, which our ample and long-enjoyed opportunities might have been expected to secure. Nevertheless, we hesitate not to legislate for most of these nations and tribes—we enact new and modify old laws, we force them to change their immemorial customs and manners, we set up schools for their instruction, we scatter amongst them our literature of all descriptions, and invite them to imitate our freedom of thought by the unrestricted use of the public press. In short, we do not trouble ourselves to study with much of either care or attention the various strongly marked features whereby, in very many instances, they are so widely distinguished from each other, and from us their governors. We know that they are men, and beyond this give ourselves little concern to study with intelligent scrutiny the wonderful diversities they present, the causes of those diversities, and the consideration that these demand at our hands. On the contrary, we seem to content ourselves, so long as the dread of our power shall secure obedience, to treat them according to our own peculiar humour and profound prejudices. This state of things in the East may perhaps endure for a long time; but it is neither honourable to us as a nation, nor safe to the stability of our rule. The medical profession might do something towards remedying this state of ignorance and apathy. Considering the large number of medical men, and those, too, of an enterprising and energetic character, to be found in our possessions in all parts of the world, it is remarkable how few have trod in the steps of such men as Russell of Aleppo and Winterbottom of Sierra Leone.* It can be owing to neither lack of the necessary talent, leisure, nor opportunity, but to a spirit of indifference, which it is easier to point out than to account for. To such of my professional brethren in India as may chance to peruse this very imperfect contribution to the natural history of the Hindus, I now make an earnest and respectful appeal, and request their attention to those points of my inquiry needing further elucidation—all the points do, more or less—and solicit their friendly aid either in the way of private communication, or, what will be equally agreeable to me, through the medical press.

*May* 1845.

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## ART. VIII.—*Case of Poisoning by Hemlock,* (*Conium Maculatum.*) By JOHN HUGHES BENNETT, M. D., Lecturer on Pathology and the Practice of Physic, Pathologist to the Royal Infirmary, &c.

ON Monday, April 21st, about seven o'clock in the evening, a man called Duncan Gow was brought into the Infirmary by two policemen. It was stated that he had been found lying in the street apparently in a state of intoxication or in a fit. On being taken into the waiting-room, he was found to be dead. On the 24th I examined his body, and the following is an account of the appearances observed.

The body was well-formed and muscular. There were no external marks of violence. The back and depending portions were livid from sugillation.

*Head.*—An unusual quantity of fluid blood flowed from the scalp and longitudinal sinus when divided. There was slight serous effusion below the arachnoid membrane, and about two drachms of clear serum in the lateral ventricles. The substance of the brain was soft throughout; on section presented numerous bloody points, but was otherwise healthy. No fracture could be discovered in any part of the cranium.

*Chest.*—There were slight adhesions between the pleuræ on both sides superiorly. The apices of both lungs were strongly puckered. On the right side below the puckering were two cretaceous concretions the size of peas, surrounded by chronic pneumonia and pigmentary deposit. On the left side only induration, with hard, black, gritty particles existed below the puckering. The structure of the lungs otherwise was healthy, although they were throughout intensely engorged with dark-red fluid blood. The *heart* was healthy in structure, but soft and flabby. The blood in the cavities was mostly fluid, presenting only here and there a few small grumous clots.

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* I refer to "The Natural History of Aleppo," 2 vols. 4to, 1794, by Alexander Russell, M. D.; and "An Account of the Natives of Sierra Leone," 2 vols. 8vo, 1803, by Thomas Winterbottom, M. D.

*Abdomen.*—The *liver* was healthy. The *spleen* soft, readily breaking down under the fingers. The *kidnies* were of a brownish-red colour throughout, owing to venous congestion, but healthy in structure. The *stomach* contained a pultaceous mass formed of some raw green vegétable resembling parsley. Its contents weighed eleven ounces, and had an acid and slight spirituous odour. The mucous coat was much congested, especially at its cardiac extremity. Here there were numerous extravasations of dark-red blood, below the epithelium, over a space about the size of the hand. The *intestines* were healthy, here and there presenting patches of congestion in the mucous coat. The *bladder* was healthy, its inner surface much congested from venous obstruction.

The *blood* throughout the body was of a dark colour and fluid, even in the heart and large vessels.

From the absence of structural lesion, and the general fluidity of the blood, I was induced to suspect that the vegetable matter found in the stomach was of a poisonous nature. On examining this more minutely it was seen to be composed chiefly of fragments of green leaves and leaf-stalks. Although much was reduced to a pulp, a considerable quantity of both had escaped the action of the teeth. The same afternoon I carried as perfect a specimen of the fragments as could be found to Dr Christison, who pointed out that they could scarcely be anything else than the *laciniæ* of the *Conium maculatum* or common hemlock. Next day I bruised some of the leaves in a mortar, with a solution of potash, when the peculiar mousy odour of Conia was evolved so strongly, that Dr Douglas Maclagan and others, although previously unacquainted with its nature, at once pronounced it to be hemlock. Dr Christison also procured a recent specimen of the *Conium maculatum* from Salisbury Crags, the botanical characters of which, on being compared with the fragments found in the stomach, were proved to be identical. No doubt could exist, therefore, that the man died from having eaten hemlock.

Few cases of poisoning with this plant have hitherto been published, and none have been minutely detailed. The effects imputed to it in the notices given of prior cases are very contradictory. In some it is said to have caused death like opium, by stupor and coma. In others, convulsions or delirium of the frantic kind are symptoms stated to have been present. But the effects observed by Dr Christison in the lower animals, in his experiments with extract of hemlock and its alkaloid conia, are totally different, viz.

" palsy, first of the voluntary muscles, next of the chest, lastly of the diaphragm; asphyxia, in short, from paralysis without insensibility, and with slight occasional twitches only of the limbs."* On this account, as well as from the circumstance that considerable interest is connected with the question, as to whether the hemlock of modern times be the Κωνειον, or state poison of the Athenians, great pains have been taken to obtain a perfect history of the case. In preparing it I have endeavoured to insure accuracy, by carefully interrogating all who saw him from the time of his eating the hemlock until the period when he was brought into the Infirmary. Fortunately he was seen by many persons, and their several accounts are on the whole consistent, and render the case tolerably perfect.

I learnt from his wife that the man, forty-three years of age, a tailor by trade, was in such reduced circumstances that he had not eaten anything on Monday, until he took the substance which caused his death. About the middle of the day, however, he and two others shared half-a-mutchkin of whisky between them. Two of his children, a boy and girl, aged respectively ten and six years of age, found what they took for parsley, growing on the bank under Sir Walter Scott's Monument, and knowing that their father was very fond of this as well as other green vegetables, they gathered some to take to him. On visiting the place with the boy, four days afterwards, I found that the spot from whence the plants were gathered had been covered over with fresh rubbish. But on the uncovered part of the bank, eighty yards westward, the *Conium maculatum* may still be seen growing in considerable quantity. The children returned home between three and four o'clock P. M. The father, who had fasted the whole day, greedily eat the vegetables, together with a piece of bread, and said more than once how good they were. The quantity consumed could not be ascertained, for he eat nearly all that was brought. On finishing his meal, he rose, saying he would endeavour to get some money in order to procure food for his children. At this time he was in perfect health.

From his own house at the head of the Canongate, Gow walked about half a mile to the house of one Wright in the West Port, with a view of selling him some small matter. Wright, on his entering the room, thought at first that he was intoxicated, because he staggered in walking. On passing through the door also, which was narrow, he faultered in his gait, and afterwards sat down hastily. He staid ten minutes, during which time he conversed readily, drove a hard bargain, and obtained fourpence for what he sold. He did not complain of pain or uneasiness, was not excited in manner or speech, and his face was pale and wan. On rising from his chair he was observed by Wright's boy to fall back again, as if he had some difficulty in rising. On making a second effort he got up, and was seen by Wright's wife to stagger out of the house and down the steps. To some children who were sitting on the steps, he said "Get out of the way of the lame horse." This was a little after four o'clock.

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* Treatise on Poisons, p. 655, 1845.

On leaving Wright's house, he was next seen, standing with his back against the corner of the street, by Andrew M'All, a meal-dealer in the Grass Market, about 200 yards from Wright's house. M'All saw him leave the corner he was leaning against, and stagger to a lamp-post a few yards farther on. Here he again paused for a few minutes, and then again went forward in the same vacillating manner, passed M'All's shop, and sat down at the opening of the common stair next to it. M'All's words are, "He could not walk rightly, and was staggering as a man in liquor." His mode of progression attracted a number of boys and girls, who laughed at him, believing him to be intoxicated. He was heard to speak to them, but what he said is not known. He was also seen by two women, who told a policeman to take him away.

The policeman, James Mitchell, No. 161, told me that, on finding Gow sitting at the foot of the common stair, he thought he was drunk. He spoke to him, and in reply Gow desired to be taken to his own house at the top of the Canongate. He also said that he had completely lost his sight, and had not the perfect use of his limbs, but expressed his willingness to walk forwards, until the policeman could obtain the assistance of his comrade in the Cowgate. He was then raised up and supported by one arm, but, after moving with great difficulty past four or five shops, his legs bent under him, and he fell upon his knees. Mitchell then gave him some water to drink, which he was incapable of swallowing, and left him to get a barrow. On his return, he found him surrounded by women, who were pouring cold water on his head, and sprinkling his forehead. With the assistance of another policeman (James Hastie, No. 111), he was then placed on the barrow. One of the women, Mrs Anderson, on his being raised, saw that he made no attempt to walk, but that, as he was pulled away by the policemen, his legs were dragged or trailed after him.

The second policeman, Hastie, on first seeing him told Mitchell that it was not drink, but a fit, that was the matter with him. He lifted up his eye-lids and found the eyes dull. He seemed sensible and endeavoured to say something, but could not articulate. He was now slowly conveyed to the main police office in the High Street, where he arrived about six o'clock. Mitchell told the police lieutenant on duty, that, from the manner in which the man was lying, and from the loss of power in the legs, he now thought he was *not* intoxicated. At this period, it would seem that, although the limbs were completely paralysed, the intelligence was still perfect, for he told the turnkey his exact address in the Canongate, in reply to a question.

Dr Tait, surgeon to the police force, was now sent for, who, in reply to a note which I addressed to him on this subject, forwarded me the following answer.

*Police Office, 26th April* 1845.

My Dear Sir,—I first saw the man Gow, to whom your note refers, about a quarter past six o'clock. The first impression produced on my mind from his appearance was, that he was in a state of intoxication. He was then lying on his back, with his head and shoulders elevated upon a board we have in the office for that purpose. He was sensible when I spoke to him, and tried to turn his face towards me, and slightly raised his eye-lids, but appeared unable to speak. His power of motion appeared completely prostrated, for when I lifted his arm, and laid it down, it lay where it was put; and when his arm pits were tickled he seemed to manifest a little sensibility, but could make no exertion to rid himself of the annoyance. There were occasional movements of the left leg, but they appeared rather to be spasmodic than voluntary. Several efforts were made to vomit, but these were ineffectual. His pulse and breathing were perfectly natural. I thought I perceived the odour of spirits about him, but the policeman who brought him to the office thought otherwise. He had spoken to the turnkey a few minutes before I arrived. Heat of skin natural. I visited him again about ten minutes before seven o'clock, at which time all motion of the chest appeared to have ceased; the action of the heart was very feeble, and the countenance had a cadaveric expression; pupils fixed. He was then sent to the Infirmary, where I think he would arrive about five minutes past seven.—I am, &c.

William Tait.

He was conveyed to the Infirmary by Hastie and another policeman, M'Pherson. After being put on the stretcher, Hastie saw him draw the legs gently upwards, as if to prevent their hanging over the iron at its extremity. This was the last movement he was seen to make. On being carried into the waiting-room of the Infirmary, he was visited by the house clerk on duty, who found him pulseless, and declared him to be dead. This was shortly after seven o'clock P. M.

The account now given serves to trace the man's history with little interruption from the taking of the poison till his entrance into the Infirmary. It is important to remark, however, that the fourpence he received from Wright was not found upon his person. Whether it escaped from his pocket, or whether he obtained spirits after his leaving Wright's house, and before he was seen by M'All, cannot be ascertained. The faint odour of whisky found in the stomach, unless it arose from the portion taken earlier in the day, would countenance such a supposition, although its not being perceived by the policemen who took him in charge, notwithstanding their suspicions of drunkenness, is opposed to that opinion.

The time of day mentioned by the different narrators, shows that the poison, shortly after it was taken, produced want of power in the inferior extremities, without causing any pain. This is proved by what took place in Wright's house. His gait, which at that time was faultering, afterwards became vacillating, he staggered as one drunk—at length his limbs refused to support him, and he fell. On being raised, his legs dragged after him—and lastly, when the arms were lifted, they fell like inert masses, and remained immoveable. Perfect paralysis of the inferior extremities was ascertained to exist one hour and a half after the poison was taken, and that of the arms half an hour later.

As regards the existence of sensibility, we have only the evidence afforded by tickling the arm-pits, which, according to Dr Tait, seemed to excite it a little. The amaurosis, however, is a proof that one nerve of sensibility at all events was paralyzed. This seems to have happened when perfect paralysis of the inferior extremities was manifested.

The excito-motory functions seemed also paralysed. Tickling the arm-pits failed in producing movements. He lost the power of deglutition. Dr Tait says his efforts to vomit were ineffectual. There were no convulsions, only slight occasional movements of the left leg—and lastly, both inferior extremities were slowly drawn upwards when placed over the iron of the stretcher. Three hours after taking the poison, the respiratory movements had ceased; the pupils were fixed. At this time the heart's action was felt very feeble. These also ceased about ten minutes afterwards.

The intelligence remained perfect up to a very late period. When his movements were vacillating he was seen to direct his steps from one fixed point to another. After paralysis of the inferior extremities was fully developed he gave accurate directions how he was to be taken home, and described his principal symptoms. Two hours after taking the hemlock, when brought into the police office, although he could not swallow, he gave his address; and a quarter of an hour afterwards, when seen by Dr Tait, though he could not speak, he appeared sensible, and tried to turn his face towards him.

Death took place about three hours and a quarter after eating the poison, and was evidently occasioned by gradual asphyxia from paralysis of the muscles of respiration. The appearances observed in the mucous membrane of the stomach were most probably caused by the unusual fluidity of the blood, and this in its turn by the gradual asphyxia.

The phenomena observed in Gow fully corroborate the physiological action of this substance as described by Dr Christison, from his experiments on animals.* Hemlock evidently acts upon the spinal chord, producing directly opposite effects to those occasioned by strychnia. Paralysis of the voluntary muscles, creeping from below upwards, is the characteristic symptom, unaccompanied by pains or derangement of the intellectual faculties. Some authors have described delirium and frenzy, and others giddiness and convulsions to have been occasioned. But such symptoms were not observed in the case of Gow, or in the experiments on the lower animals by Dr Christison. Indeed, the symptoms as they were described by Plato in the case of Socrates, resemble as nearly as possible those which appeared in Gow. We are told that Socrates was directed by the executioner to walk about after swallowing the poison, until his limbs should grow heavy. He did so, and then lay down. On his feet and legs being squeezed, they were found insensible: they were also pointed out by the executioner to be cold and stiff. When paralysis had proceeded upwards to the abdomen, Socrates made a request to Crito, proving that his intellects were then unaffected. In a short time after, he became convulsed, his eyes were fixed, and he died. Whether stiffness was present in Gow's case, was not ascertained. The nature of the convulsions, whether violent or otherwise, is not stated in the account of Plato, but slight spasms were observed in Gow.

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* Transactions of the Royal Society of Edinburgh, vol. xiii.

It will be observed that when Socrates felt paralysis coming on he lay down. Hence the staggering and falling in the street, observed in Gow, did not take place. The description of the effects of the Κωνειον, given by Nicander, however, would in this case apply with great accuracy. He says, (I quote from Dr Christison's paper,) " This potion carries destruction to the powers of the mind, bringing shady darkness, and makes the eyes roll. But staggering on their footsteps and tripping on the streets, they creep on their hands. Mortal stifling seizes the upper part of the neck, and obstructs the narrow passage of the throat. The extremities grow cold, the strong vessels in the limbs contract, he ceases to draw in the thin air, like one fainting, and the soul visits Pluto." If we abstract the poetical parts of the description, and remember the loss of sight, staggering and tripping in the street, the difficulty of deglutition, and place the loss of the intellectual faculties last, this account of Nicander agrees very well with what was observed in Gow.

A difference of opinion exists as to whether the *Conium maculatum* of modern botanists be the Κωνειον of the ancient Greeks. Into the botanical controversy I do not feel myself qualified to enter. But if the symptoms ascertained to have existed in the case I have related, be compared with the accounts of Plato and Nicander, I cannot help thinking that it will be found to favour the opinion of those who believe in their identity.

# PART II.

## CRITICAL ANALYSIS.

### Art. I.—*The Anatomy of Sleep, or the Art of procuring sound and refreshing Slumber at will.* By Edward Binns, M. D., &c. &c. Second Edition, with Annotations and Additions by the Right Honourable the Earl Stanhope. 12mo. London, 1845. Pp. 505.

The Anatomy of Sleep is a notable example of how much can be made out of nothing by a little ingenuity. The aim of the work is to communicate the mode or art of procuring sound and refreshing sleep at will; and this, which is told at the end of the volume, does not take up more than one page and two lines. The remaining 503 pages, or, more properly speaking, the whole volume, with the exception of this page and few lines, is taken up with an *olla podrida* collection of facts and observations on life and its phenomena, death, sleep, drowsiness, trance, premature interments, hybernation, capability of animal body enduring extremes of heat and cold, dreams, somnambulism, catalepsy, hallucination, monomania, fainting, asphyxia, syncope, suffocation, drowning, hanging, mesmerism, systems of organization, mental phenomena, sleeplessness, arterialization, narcotism, &c., in fact every thing which could be made to seem in any, even the most distant way, connected with the phenomena of sleep. No, we are wrong in saying every thing; for, in none of his illustrations of the nature of sleep, does Dr Binns take notice of the connection between the stertor during sleep and the stertor during comatose states; nowhere does he show the analogy between coma and sleep. Dr Binns's diligence in collecting facts and observations on the above-mentioned subjects has been great, and the consequence has been a most amusing work, better fitted, however, to advance the author's popularity as an amusing writer than his reputation as a man of science. Dr Binns, in fact, can have no pretensions to the character of a philosophic writer, for he has neither advanced our knowledge of what sleep is, nor has he even attempted to prove by reasoning, by observation, or by experiment, that his crude views of the nature of sleep are correct. We shall therefore first notice the author's statements on this point, and then turn to the more amusing parts of his work.

"If life be a succession of ideas, (says Dr Binns,) SLEEP is the remission; consequently, SLEEP is the escape or absence of reflection. In brutes, it is the cessation of the functions of the voluntary muscles, through the repose of the senses."—P. 1.

One would naturally imagine, from this opening paragraph, that our author would draw the philosophic conclusion of Bichat, that sleep was a negative, and not a positive function. But no. Dr Binns, apparently for no other reason than that the animal still lives while asleep, and that its digestion, respiration, circulation, and nutrition are going on, concludes that "sleep, then, is not a negative, but a positive state of existence," or, as he elsewhere calls it, "a positive function;" and he seems not a little offended that physiologists should not have assigned separate organs to preside over sleep, as well as lungs for breathing, or a brain for thinking. Accordingly, Dr Binns assumes that such an organ must be present in the animal body, and asks, "But where is this organ situated? In the cerebrum, cerebellum, or *medulla oblongata?* We think in no one of these organs, but that we are to look for it in the *medulla spinalis*, or spinal cord, and that it will be found between the cervical and lumbar vertebræ, in the *ganglia* formed from the nerves given off by this portion of the spinal column."—P. 428.

We should have deemed it almost unnecessary to have attempted the refutation of such visionary and baseless theories could we have supposed the author ignorant of the functions of those ganglia to which he alludes; but standing in the position of a physician, who ought to be acquainted with what is going on in the medical world, we cannot give him credit for ignorance, especially seeing he could have corrected in this his second edition any mistakes into which he had fallen in the first.

The valuable researches of Brachet, whose work was published in 1830, corroborated as they have been by subsequent inquirers, proved that the ganglia preside over those functions and acts which, were they to cease for one moment, would cause the death of the animal. It is by the ganglionic influence that the heart, the vessels, the bowels, the glandular organs, &c. perform their ceaseless, never-tiring functions—functions which cease but with life. Now, one most remarkable peculiarity of the organs which these ganglia supply with nerves is that they never sleep; they are equally awake whether the person be sleeping or waking. For this, however, we may find a reason. Most of the organs supplied with nerves from ganglia undergo constant alternations of excitement and repose. This is very marked with regard to the lungs, heart, bowels, and arteries; and it might be worth while to inquire whether all the glandular organs are not in a similar state; *i. e.* whether during the passage of the pulse of arterial blood they are in the state of excitement, and in a state of repose during the interval between the pulsations. However the case be with the glands, the fact is certain with regard to the first-mentioned organs. Now these organs never sleep; consequently the ganglia which supply these organs with nerves, and keep them constantly awake, could never act in a directly opposite manner on the other organs of the body over which they exert no direct influence. The brain and spinal chord, or the larger ganglionic knots in the lower animals, supply distinct organs—organs which are under the dominion of the will—organs which are stimulated to action by the will—organs which after a certain amount of exertion require a certain period of repose. Now it is these voluntarily excited and exciting organs which require repose in sleep—sleep is their repose. Sleep is to them that state which the relaxation is to the contraction of the heart and muscles of the bowels; sleep is to them a state analogous to that repose which the respiratory muscles experience during expiration. Sleep is therefore, as Bichat and other physiologists have wisely styled it, a negative state—negative, as opposed to the active state of the voluntary organs during the waking period—negative, because it is the state of repose of organs which are active during wakefulness—negative, because it is the cessation of the functions of these organs.

Seeing that such is the case, whatever will produce or induce quiescence of volition, mental and corporeal, will allow this state to steal over the animal body. How, it may be inquired, have men in all ages endeavoured to coax sleep, but by endeavouring by some means or other to bring on the very mental and corporeal quiescence—by endeavouring to produce a monotony which quells the activity of the mind—by directing the restless mind to one and one only train till it falls asleep under the fatigue of monotony? Hence the known languor induced by listening to the murmur of waters, to the sighing of the breeze through the trees, to monotonous sounds, as reading, or to repeating over some well-known verses or prayers, or by keeping the eyes fixed on one spot—all are alone referrible to arresting the further progress of thought by fixing it on one point, which by its monotony allays its restlessness, and allows tired nature's sweet restorer, balmy sleep, to steep the senses in forgetfulness.

That this has been recognised and acted on from the earliest ages is not only apparent from the fact that all the means proposed to induce sleep naturally have this effect, viz. producing a monotony of thought, so that by the continual recurrence of the same idea thought itself becomes extinguished; but has even attracted the attention of the poets, a few of whose most beautiful passages take notice of the fact. Indeed so prevalent is the idea that monotony will induce sleep, that our celebrated Irish bard Moore attributes the very same effect to montonous beauty.

> "Shining on, shining on, by no shadow made tender
> Till love falls asleep in its sameness of splendour."

Now what does Dr Binns do more than this with all his new and unsupported theory? Why positively he arrives at the very same conclusion. His celebrated recipe for the procuring sound and refreshing slumber at will, not by the bye his own after all, but the late eccentric Mr Gardner's, is as follows.

> "Having taken a full inspiration, the lungs are then to be left to their own action,—that is, the respiration is neither to be accelerated nor retarded too much, but a very full inspiration must be taken. The attention must now be fixed upon the action in which the patient is engaged. He must depict to himself that he sees the breath passing from his nostrils in a continuous stream; and the very instant that he brings his mind to conceive this apart from all other ideas, consciousness and memory depart, imagination slumbers, fancy becomes dormant, thought ceases, the sentient faculties lose their susceptibility, the vital or ganglionic system assumes the sovereignty, and, as we before remarked, he no longer wakes, but sleeps; for the instant the mind is brought to the contemplation of a single sensation, that instant the sensorium abdicates the throne, and the hypnotic faculty steeps it in oblivion."—P. 436.

This is the grand recipe, to communicate which to the world this volume was written. And what is it, after all, more than all were previously aware of? It is simply another way of producing monotony; it is simply the abstraction of the mind from other thoughts to one, which, by its monotony, lulls its restlessness to rest, and allows the negative function, sleep, to steal over the senses.

That sleep can be induced by narcotics, that it is favoured by the removal of all stimuli, that it is induced by many affections and injuries of the brain, which destroy mental and corporeal volition, still further tends to prove that sleep is a negative function. We are, therefore, not necessitated to look out for an organ to preside over sleep; and if an organ did preside over that function, it would not be one like a ganglion, distributed only to the viscera and blood-vessels, but must necessarily be one whose ramifications pervaded the whole economy, stretching to the most distant organs of the body, and especially to the voluntary organs.

If, however, we attempted to determine in what particular organ or set of organs this negative function was seated, we would not for a moment hesitate to say in the brain and spinal chord, or, in the lower animals, in the larger nervous centres. The experiments and observations of Bichat, Blumenbach, Wilson Philip, Flourens, Longet, &c. notwithstanding that their theories differ somewhat from each other, most unquestionably prove that the proximate cause of sleep is an increased proportion of venous blood in the brain, and a diminished flow of arterial blood. Dr Lyon Playfair, merely pursuing Blumenbach's views, perhaps without being aware of them, and showing their accordance with Liebig's theory, refines on the above simple facts, and attributes sleep to the arrestment of that oxygenation or waste of the brain, which he assumes, without any proof, goes on during the exercise of thought, or during watchfulness; and Dr Wilson Philip, also taking a chemical view of the question, attributes it to the accumulation of carbon in the blood. Whichever explanation we adopt, the fact remains undoubted of the diminished flow of arterial blood, and the increased amount of venous blood in the brain or nervous centres during sleep. This explains philosophically all the phenomena, and, if taken in connection with the chemical explanation of its *modus operandi*, forms a beautiful and consistent theory. Of Dr Binns's theory, and his supposed organ in which the sense of sleep is situated, the less said the better.

A fact has been long known to us strongly corroborative of the above philosophic view of the cause of sleep; and we are chiefly induced to allude to it, and point out its true cause, because some mesmeric believers have been lately gulling the public by making them believe it was the production of a mesmeric state in the lower animals. A bird is taken into the hand, and after being held there for a little while, with its head bent down, is laid on the ground, and a chalk line is drawn in a line with its bill. It lies there for about five minutes perfectly motionless, when it gradually awakes as from a sleep. This has been styled the production of mesmeric sleep in birds. Almost every clodpole knows how to do this with domestic poultry, as we have often seen; but he gives a very different explanation of the phenomena. The bird is seized, its head bent under its wing; it is then given a swing round the head, and laid on the ground. A state of stupor or sleep is produced, and so perfect is it for a short while, that we have seen nearly a dozen fowls lying side by side in this comatose state. The country people attribute the state to the bird being rendered giddy by the swing which is given to it; but the same state is produced by holding the bird's head under the wing without giving it any swing. This state of stupor is evidently produced by the very same process which the bird itself follows when it wishes to retire to rest. It bends its head under its wing, produces thus a diminished flow of arterial blood, and a somewhat congested state of the venous circulation, which, by inducing that mental and corporeal quiescence to which we have above alluded, allows the state called sleep to be produced.

Before leaving this subject it may be stated that, in so far as the recipe for the art of procuring sleep at will is concerned, Dr Binns only takes credit for making it public; the discovery, if such it can be termed, being made by the late ingenious Mr Gardner. Dr Binns, though he assures us this recipe is infallible, with great naïvete tells us in a note that " since our first edition was published, several persons have declared that they could not induce sleep by our method." Our own experience, as well as that of many of our patients, has satisfied us that this recipe is no more certain than any of the older ones, and has no superiority over the better known modes of producing monotony. With all we have invariably found that, could the mind be kept fixed on any thing monotonous, sleep would soon steep the senses in forgetfulness; but this is the invariable difficulty. The mind wanders, and remains awake.

We have no intention of going seriatim over the various heterogeneous subjects treated of in Dr Binns's Anatomy of Sleep; but shall confine our remarks to one or two points more worthy of note.

The author is a believer in mesmerism; but after our notice of this subject in our last number, as well as the incidental allusion to it above, it seems unnecessary to touch on it again in this place. Much diligence is shown in the collection of cases of trance, and especially when the individuals have in consequence been taken for dead, and were about to be, or actually were, interred alive.

The chapter on death from drowning, hanging, &c., with the cases of resuscitation therefrom, will afford some little amusement, though it contains nothing new.

A long and curious chapter is given on hybernation, in which is shown the influence of habit in enabling animals to live on food not natural to them, in enabling the body to endure extremes of heat and of cold, the capability which several of the lower animals possess of being frozen without destroying their life, seeing they revive on being thawed, and, as connected with this, seeds and roots from the hands of mummies, where they have probably been for a period of 3000 years, growing on being put into the soil.

The subject of hybernation is one on which a good deal has been written, and several interesting experiments performed, but relative to which no very plausible theory was till very lately announced. The periodical torpidity has been most commonly considered as being intimately connected with the general phenomena of the respiration and circulation; but while one class of physiologists have referred the peculiar condition of these functions to the state of fatness in which the animals were on the approach of winter, and to the numbing effects of cold, others have endeavoured to show it depended on a voluntary suspension of the powers of life when suffering from cold and hunger, and from some other causes which they deemed themselves unable to explain. The most plausible theory we have yet seen, and one too which seems to satisfy all the requirements, is that started by Dr Stark in his paper on the nature of the nervous agency, in the sixty-first volume of this Journal. From finding that the fluid contents of the nervous tube were oily matter, which became more or less consolidated when the animal temperature was lowered, and that in proportion to this consolidation the number and force of the respirations, arterial pulsations, and activity of all the senses were diminished, he inferred that it was thus that the cold acted on the hybernating animal. The cold, in fact, first acted on the nervous system, and through it on all the organs of the body. There is not a fact stated by any writer on hybernation which will not accord with this theory. For if a hybernating animal be furnished with abundance of food, and be kept in a warm temperature, it is an ascertained fact that it will not hybernate, seeing that the abundant supply of food, as well as the warm atmosphere, prevents the temperature of its body falling so low as to render partially solid the oily contents of its nervous tubes. The same theory serves to explain the vivifying effects of heat on a hybernating animal. In proportion as the heat renders more fluid the oily contents of the nervous tubes, the whole of the senses become more easily impressed by external agencies, and the respiration, circulation, and calorification of the body become more perfect. The same theory was shown to explain the production of that resistless drowsiness to which persons are liable when exposed to extreme cold, and which so nearly proved fatal to Dr Solander.

The subject of dreams is next treated of, a subject which has engaged the attention of mankind from the earliest ages, but relative to which we are not likely to arrive soon at any very definite knowledge. That dreams scarcely ever occur during the first sound sleep, or, in other words, only occur when the brain is partially active, is an undoubted fact; and that when in this state, undirected by the will, it should conjure up and jumble together past, present, and future, is not at all strange. The noted peculiarities of some individuals have taught us that dreams may be directed in certain ways by acting through the bodily senses, though the individual was not apparently aware of the action on these senses. Thus particular dreams have been excited by whispering in the ears of particular persons when asleep, or by exposing their limbs or bodies to heat or cold, to violence, to particular noises, &c. If dreams may be proved to be thus easily excited in certain persons, they may frequently owe their origin to this cause in cases where we have no means of tracing the cause. From these cases, therefore, one conclusion may be drawn, viz. that one class of dreams is produced by the mind being led into a particular train through the affection of some bodily organ. It is from this association that a man who gets uncovered during the night dreams that he is in the frozen regions, or wading through snow; that one who nearly blisters his feet with a warm bottle, dreams he is walking on a burning mountain.

Another class of dreams is produced by the mind having been strongly excited by some subject during the day. As soon, therefore, as the body is recruited by a few hours' sleep, the same form of excitation is renewed unconsciously, and being undirected by the will often produces remarkable dreams.

The most common class of dreams, however, appear to have no very ascertainable cause, and confuse in one strange jumble past and present incidents and friends; even in some cases causing our thoughts and resolves for the future to appear before us as if already past. Such dreams have, in general, no stability, but pass without surprising us, either abruptly or insensibly from one subject to another, and rarely have any definite end.

But there is still a fourth class of dreams, viz. the warning or supernatural dreams; and it is these which have occasioned the greatest disputes as to their mode of production. In many, perhaps in most cases, they are no other than instances of the second class. For example, a person with a dear friend abroad, dreams that he sees him carried past in a coffin, or sitting in a church in a long white dress, and awaking in a fright, draws the conclusion his friend has died, and that this was an intimation thereof. When such a person is closely questioned we frequently find that the person has been anxiously expecting news from his friend, has heard perhaps he was ill, or knew he was in a delicate state of health; or, what we believe is still more common, has heard of the severe illness or death of some friend or acquaintance in his neighbourhood, when his thoughts in dreaming ally the death or illness of this near acquaintance with the one abroad, of whom he was not even thinking during his waking hours. We suspect that by far the greater proportion of dreams commonly styled warning or supernatural, are to be explained in this way, in which case they come under our second class. But it would perhaps be going too far to assert that, could we trace all the circumstances, all such dreams might be explained on the same supposition. We are inclined to suspect that some things related as dreams are in reality hallucinations, which, thanks to Nicolai and others, are now referred to their true cause.

One form of the warning or supernatural dream, which it seems difficult to account for on any natural explanation, is, that where the person sees distinctly in a dream, an occurrence which happens afterwards to himself or his friends in all its circumstantial details; or where he sees an occurrence which has already happened, but which was wholly unknown to and unsuspected by the dreaming party. A few very curious dreams of this class, they ought rather to be called visions, are narrated by Dr Binns. as well as added in notes by Earl Stanhope; and it is to this form in especial we feel inclined to limit the fourth class of dreams, to which we apply the terms warning or supernatural.

Certain dreams, however, do not take cognisance of the occurrence itself, but of some other incident which custom interprets to have a particular meaning; and it is not unfrequently the coincidence of the dream with the fulfilment of the interpretation which causes such dreams to be paid especial attention to. Had the coincidence not occurred the dream would have been held at its true value—as worthless. For instance, it is a common belief that dreaming of the dropping out of a tooth denotes the death of a near friend or some serious calamity. A lady of an acquaintance dreamt that one of her teeth dropped out, and as she is a nervous, excitable woman, awoke in a great fright, told her husband her dream, and said she was sure they would here of the death of their eldest son then on the African coast. A few mornings thereafter a letter arrived stating that her eldest son had died of yellow fever about four months previously. For weeks she had been uneasy at not hearing from this son. The dream and its fulfilment was therefore a mere coincidence. She had, however, at the same time, another son at sea in the China voyage, and from him too she had not heard for many months. About a fortnight after hearing of the death of her eldest son, she dreamed that another tooth had dropped out, and the dream was repeated thrice during the same night. She was in a state of great nervous excitement for many days thereafter, and confidently expected to hear of her remaining son's death. The dream was not, however, realized according to her fears, for in about a month thereafter her son arrived safe. Such is ever the way with dreams. Man distresses himself with the vain unsubstantial shadow of a dream, because, in a few well-remembered cases, their interpretation has coincided with the reality.

Such, then, are the four classes into which we feel inclined to divide dreams; and they appear to answer the purposes of classification fully as well as, if not better than, any yet suggested.

The chapter on Somnambulism is curious; but we cannot see what connection catalepsy has with the anatomy of sleep any more than epilepsy, apoplexy, concussion, or coma, of which no notice is taken. Coma at least ought to have been considered, and its phenomena carefully compared with those of sleep. Catalepsy, however, seems to be used as the stalking horse for the introduction of the very curious cases of ecstacy in the Estatica of Caldero and the Addolorata of Capriana.

The chapter on Hallucinations, Apparitions, and Monomania, is interesting, though it throws no new light on the subjects of which it treats. The author, however, appears somehow to confuse hallucination with monomania, and quotes cases of the one as instances of the other, as if they were synonymous. Nicolai's and Dr Hibbert's philosophic works on apparitions have served to place these visionary appearances in their true light, but still it has always appeared to us that they, in common with all late writers on the subject, still left something unexplained. Every one must, of course, admit that when a phantom is seen or heard by only one, it is reasonable to suppose that it depends on the peculiar state of that individual's brain or general system, as has been so satisfactorily proved by late writers. But there are a very few cases in which the apparition has been also seen by more than one individual, or, at the same time, by some of the lower animals, and in circumstances which preclude us from entertaining the idea that the same train of morbid ideas was conjured up by exposure to a similar cause. The instances where noises resembling footsteps, the rustling of dress, heavy breathing, &c. have been *heard*, which were also heard by others or by the lower animals, ought never to be instanced as cases of this form of apparition or hallucination, though they are the only ones of the kind instanced by Dr Binns or the Earl Stanhope; because the sense of hearing is very apt to be deceived and imposed on, and most cases of this nature which have been traced, have been proved to have owed their origin to designing servants or neighbours, or to other causes not connected with supernatural agency or hallucination. We are induced thus strongly to express our opinion relative to cases, the evidence of which depends on the sense of hearing, being admitted into the list of apparitions, from having in our own family met with a remarkable example of the kind, in which, by mere accident, the cause was discovered, after five adults and three children, the youngest ten years of age, were convinced that the noise depended on the presence of some supernatural being.

Shortly after our sisters, girls of about ten and fifteen years of age, had retired to rest, suppressed screams were heard issuing from their room. The nursery-maid was sent up to ascertain the cause, but instantly returned, taking half-a-dozen steps at a bound, and so frightened that she could not speak. We then ran up stairs, carried our sisters to our own bedroom, and with difficulty ascertained from them that the cause of their fright was a distinct heavy breathing which they heard in their room, though they had ascertained before going to bed that no one was concealed about it. Provided with candles and an old sword, we proceeded to search the room minutely. No person, however, could be discovered either in it or in the adjoining rooms, or in the garrets above. When we listened we heard most distinctly the sounds of regular heavy breathing, as loud as if a tired labourer had been asleep in the middle of the apartment. After half an hour's search we were all most thoroughly convinced that the sound owed its origin to something supernatural. Thoroughly alarmed, therefore, we were just about to lock up the haunted room when one of the girls fainted with fright at sleeping in a haunted house, and in falling came in contact with a bottle containing a hot infusion of Epsom salts, and knocked out its cork. A whiz produced by the escape of confined steam explained the whole mystery. The water in which the salts had been infused was boiling. It had been loosely corked. The generation of steam raised the cork, in doing which it was all the time escaping and produced the sound resembling the prolonged heavy inspiration. When the cork was so far raised as to allow the cold air to rush in, the steam was condensed, and the deeper and shorter sound was produced, resembling the semistertorous expiration. Never in our life have we heard a more close imitation of deep heavy human breathing, and had we not heard the sound and seen its cause thoroughly ascertained, could never have been persuaded that the sounds we heard did not proceed from something supernatural.

The following case, however, is one of those very rare ones to which we have above alluded, as one of those whose explanation baffles the philosophic inquirer. The case, indeed, is almost the only authentic one to which we could refer, and as it occurred to a particular friend, and every circumstance was minutely inquired into at the time, the narration is as authentic as such things can be. It may add to the interest of this case to state that it was communicated several years ago to Dr Hibbert, after the publication of his work on Apparitions, when he confessed that he could not explain it in the same philosophic manner in which he was able to account for all others, and that it appeared to him more nearly to approach the supernatural.

" F. M. S. was passing through the Wolf-ridge Wood at Alverston one night about twelve o'clock, accompanied by his dog, a breed between the Newfoundland and mastiff, a powerful animal, who feared neither man nor beast. He had a fowling-piece and a pair of pistols loaded, besides his sword, for he belonged to the military school there, and had been out on a day's shooting. The road ran through the middle of the wood; and very nearly in the centre of the wood, at a part somewhat more open than the rest, there was a cross erected to point out the spot where a game-keeper was murdered. The place had the reputation of being haunted, and the ghost, it was said, had been frequently seen. S. had frequently before this passed this cross in the wood without seeing any thing, and treated the story of the ghost so lightly, that he has on more occasions than one, for a bet, gone there at midnight and returned without meeting any thing excepting an occasional gamekeeper or poacher. This night, when he approached the open space in the wood, he thought he perceived, at the other end of the open spot, the indistinct form of a man, more indistinct, however, than usual. He therefore called his dog to his side, (for previously it had been ranging about, barking furiously, and giving chase to the game it started,) patted it on the head to make it keep a sharp look-out, and cocked his gun. His dog, on this, was all impatience. He challenged the figure, but no answer was returned. He then suspected it was a poacher, and prepared for an encounter, and directed the dog's attention to the figure, who answered by growling. He then kept his eyes steadily fixed on the figure, when instantaneously it glided to within arm's length of him. He looked steadfastly in the face of the figure, which kept its eyes fixed on his. It made no noise or rustling on its approach. The face was ill defined, but distinctly visible. He could not turn his eyes from those of the figure; he was fascinated as it were to the spot; he had no power in his frame; he felt no fear of bodily injury, but a certain indescribable kind of awe. His eyes were so fascinated by those of the figure, that he did not observe the dress it appeared in, nor even its form. It looked calmly, and with a mild look all the time of its appearance, which he does not think exceeded half a minute, when it suddenly became invisible. The form had flitted before him about five minutes altogether. The dog, which before this was furious, growling, &c. now stood crouched at his feet as if in a trance,—his jaw fallen, his limbs quivering, his whole frame agitated, and covered with a cold perspiration. After the form disappeared, he touched it, then spoke to it, without its seeming to recognise him, and it was only after a little while that it seemed to recover its senses. The whole way home it never moved from his side, but kept close to his feet, nor did it offer to run after or even take notice of the game which they started on their way home. It was a fortnight before it recovered from the fright, but never afterwards was the same lively animal. No persuasion could ever again induce that dog to enter the wood after nightfall, nor would it allow any of the family to enter it. When it was forced to pass the open spot by daylight, it would only do so with its master, always, however, exhibiting signs of fear, trembling all the time, and walking silently by his side. S. has frequently since passed this spot in the wood at the midnight hour, but has never again seen the figure. Before this occurrence, he had always treated with ridicule any stories about ghosts or spirits, but is now a firm believer in both."

This is almost the only recorded case known to us where the evidence is so strong, as to leave no other impression on the mind but that it was the appearance of some supernatural agency; and, after having in vain endeavoured to explain it on any other supposition, we found ourselves forced to conclude with Hamlet, that

> "There are more things in heaven and earth
> Than are dreamt of in your philosophy."

The remaining portion of Dr Binns's work would have been materially improved in several of its parts by embodying the more recent researches on anatomy and physiology,—more especially of the nervous system. For instance, for an author in 1845 to limit his description of the nerves, &c. to the antiquated and erroneous statements of Raspail, whose errors have been demonstrated by at least half a dozen writers of eminence since, is to propagate error, is to go back and not forward in knowledge. It is no apology to the public to say he is "a man more sinned against than sinning," because forsooth he takes shelter under Dr Elliotson's wing. A man who writes a work should consult the latest and best authorities themselves, and take no fact or statement at second hand.

The sixty-five pages of appendix consist of notes chiefly furnished by the Earl of Stanhope. They relate anecdotes and facts which have reference to the varied topics discussed in the body of the work. The most valuable and curious of these are perhaps those relative to dreams and apparitions. Among them are contained the authentic accounts of the apparition which appeared to Lord Lyttleton a few days before, and announced, his death; as also the apparition of Lord Lyttleton to Mr Andrews, his boon companion, immediately after his death. It is curious, however, that one of the accounts by a cotemporary, which is also narrated, explains the apparition seen by Lord Lyttleton as having been nothing more than a vivid dream, and shows the cause of his death to have been one of those fits to which he was subject. Indeed it is on the supposition of cerebral excitement that all such appearances are to be explained, with the single exception of those excessively rare cases, such as that above related, in which the apparition appears to a man and animal under circumstances which leave no room for believing that it could have been produced by natural causes acting equally on the man and the animal.

In one of the notes is quoted from the "Vestiges of Creation," a statement intended to convey the idea that the animal and vegetable creation were progressively developed by cultivation or by accidental circumstances, or by a law of nature, by the transmutation of the simpler animals and vegetables into the more compound ones. For instance, that common grass by cultivation became converted into wheat, barley, oats, &c. To show on what grounds such assertions are made, it is stated that if oats be sown and kept cropped down during summer and autumn, and allowed to remain over winter, a thin crop of rye is the harvest presented at the close of the ensuing summer. This is quoted on the authority of a German periodical, and instead of viewing it as one of those simple cases where the oats had died out and a few grains of rye either sown along with the oats, carried out in the manure, or latent in the soil, vegetated and thinly supplied their place, it is argued that it is a true instance of conversion of oats into rye. It is surprising that any one with the slightest pretensions to the character of a man of science could so misapply his reasoning faculties. In this country we have seen more than once the very experiment alluded to accidentally made. In one instance oats were sown with tares, and were cut down early for green food before they had pushed out their ear, and were cut a second time later in the year. Next year a portion of the land on which they grew was neglected to be cultivated; but instead of rye coming up, nothing made its appearance but a plentiful abundance of the great ox-eye daisy, couch-grass, rag-weed, and the other usual weeds. In another case oats were sown along with grass seeds, but from some cause or other they came up so sparingly over the field, that cattle were turned in among them who kept them cropped short the whole season. Next year not a stalk of oats, or rye, or barley could be seen over the whole field,—only the rye grass and clover which were sown, with the usual weeds of the ground. The reason of this was abundantly obvious. In this country rye is not cultivated. In Germany it is one of the regular rotation crops. We know, however, that it is scarcely possible to turn over land but what a few stalks of some kind or other of grain will make their appearance. Rye is one of the grains which bear to be cropped down one year, and will yet produce a crop of grain the next year. Oats will not do this. If sown and kept cropped down one year, it invariably dies during the succeeding winter. Consequently, if a few grains of rye, in the German experiment, vegetated along with the oats during the first year, they would survive the winter which killed the oats, and, of course, the next year a very spare crop of rye would alone make its appearance. It is easy to see how the seeds of the rye could find their way into the ground. The shaking of the heads of the last ripe crop of rye on that field would scatter numbers of seeds, which, when the land was ploughed, would cover them too deep for vegetating till a subsequent ploughing brought them nearer the surface. Many of the particles which escape the threshing machine, not being rotted with the manure, vegetate when the manure is spread on the fields; and lastly, it is rare to see fields of grain, in Germany, so very free from rye as not to furnish some little intermixture of seeds when again sown.

Did time and space offer we could easily prove to demonstration that the whole theory of the successive development of one animal or plant of a higher class of organization from the transmutation of a species or genus of lower grade, was based on a foundation more unstable than the sand.

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Art. II.—*Human Magnetism; its claims to Dispassionate Inquiry. Being an attempt to show the Utility of its application for the relief of Human Suffering.* By W. Newnham, Esq. M. R. S. L., &c. London, 1845. Post 8vo. Pp. 432.
2. *Letters on Mesmerism.* By Harriet Martineau. London, 1845. 12mo. Pp. 65.

Among all the examples of human delusion and enthusiasm, assuredly mesmerism is most fortunate in the number and the energy of its defenders, and the zeal and occasional talent which they display in its defence. In several circumstances Mr Newnham is distinguished from those authors by whom he has been preceded or accompanied; and for various reasons his treatise demands, and will probably receive, a considerable share of attention. Whether it will make converts to the doctrines promulgated by the author, will depend in a great degree on the character of the readers. If the seed fall on favourable soil it will take root and grow, and perhaps yield other seed. If the soil, however, be unfavourable, no growth will follow.

Like a very small number of those who have defended this shadowy science, Mr Newnham was at least originally thinking of opposing it. His attention was first directed to the facts and arguments collected against Mesmerism or Magnetism, and in the study of these he thought he could recognise, amidst much error, several important truths. He was, indeed, enlisted as an opponent; and he became a champion.

This ought to be a lesson and warning to all those who are desirous to organize a regular opposition, however wise and plausible, against any doctrine or set of doctrines, however absurd and unreasonable. Many a man, and many a woman too, has begun by examining, opposing, and exposing the errors of the Roman Church, and has ended by becoming a most sincere and devout Catholic. " Let not him that girdeth on his harness boast himself as he that putteth it off."

In many respects Mr Newnham shows himself to be both a judicious and an able defender. He allows that mesmerism has suffered by the follies and quackeries with which it was associated, and perhaps by the charlatanism of its modern promulgator, Mesmer. But he argues that this forms no reason for inferring that mesmerism or magnetism is itself either a piece of folly, or delusion, or knavery; or that it ought to be rejected for the vices and errors of its professors. All this may be very true; but it must still be asked, could any other piece of human artifice or delusion have been associated with, and give rise to so many follies, so much quackery, and so large an amount of wilful and willing falsehood, deception, and collusion.

As to its finding supporters among men of a certain order of theological views, to which Mr Newnham (p. 5,) assigns great influence in retarding its progress, and especially its alleged connection with materialism, that is no more than all pieces of deviation from truth have presented, and to which they very readily accommodate themselves. And though we would neither defend nor receive a doctrine, which in its tendencies was hostile to morals and religion, yet this cry has been so frequently raised for the purpose of throwing odium on doctrines otherwise harmless, that we are averse to this mode of estimating the truth or falsehood, the justice or the erroneousness of any given doctrine, and think it preferable that every doctrine, or system of doctrines, should be tried and judged, first by itself, and upon its own merits, and without reference to consequences, real or supposed.

As little would we attach importance as an argument in favour of magnetism, to the circumstance of the *conversion* of a man like Georget, late in life, says our author, from materialism to spiritualism, in so far as we have known conversions of that kind take place from causes totally different, and because we have seen good reason to conclude, that persons prone to adopt and retain materialistical opinions form very incompetent witnesses on questions relating to psychology, morals, or religion. We have often had occasion to observe that the man who in early life was pleased with materialism, was so from downright ignorance, and from that exclusive study of physical phenomena which often tends to fill the mind with pride and confidence; and that gradually as the same individual had his mental eyes enlarged so as to admit a little more light, and his vision rectified so as to enable him to see subjects in their just relations, he at length began to think that there was something more in the world than matter, and that the actions of mankind did not depend altogether upon the organization of their bodies. This very circumstance, however, shows that, while his mind has been only in its infancy as to understanding and judgment, he has possessed a degree of confidence and presumption very unbecoming in one whose faculties were so immature.

Mr Newnham combats the vulgar error, that animal magnetism originated with Mesmer, whom he allows to be a charlatan; and he also opposes the notion that the mesmeric phenomena were merely the results of operating on the imagination. We have so often and so lately endeavoured to illustrate the history of this pretended science, that we do not now regard it as necessary to recur to that part of the subject. We have only to say that we believe that no well-informed person could believe that Mesmer was anything but a very designing knave, who, ignorantly or intentionally, revived the practice of a species of deception which had been prevalent in different forms for several centuries.

"Magnetism," according to Mr Newnham, "may be said to be the medicine of nature—to consist in the communication of the exuberant life of the healthy, to repair and sustain the deficient vitality of the sick;"—and "it is only legitimately and justly used when employed to restore that equilibrium of health which has been destroyed by malady."—P. 17.

He subsequently tells his reader, p. 22, "that most of the phenomena of magnetism, if not all, *have been found in nature*; that they have been recorded as instances of *disordered function*, and not disbelieved; and that the only new thing is that they may be produced at will, and that they may be employed for the cure of disorder."

Now, it is manifest that these statements contain a series of new and unusual assumptions. First, it is assumed that there may be an exuberance of health, and that this exuberance is capable of being transmitted or communicated from one person to another. Now, it is natural to ask, is there such a thing as an exuberance of health? Is it possible that the human frame, which, we are taught, is like the flower of the field, nay, like dust and ashes, can really be the seat of this exuberance of health? Man, we are assured, hath but a short time to live, and never abideth long in one stay, is indeed, at the moment of birth, pronounced to be mortal, to be feeble, and subject to many infirmities and diseases; and yet are we told this feeble and fleeting being, who is strong only by education, by intellect, and by combination in society, not individually, this feeble being may be the abode of exuberant health. It is quite clear that the whole of this is a mere delusion, a sort of figure of speech, or poetical mode of expressing what has no actual existence, when strictly examined, and what in every case would turn out to be just a different form of disease. Who ever saw exuberant health? and what are its indications? Such a thing is never seen by physicians, nor by any one else except poets, who have a peculiar mode of presenting what is not understood, and cannot be explained unless by giving it some aspect tangible by the imagination. Thus the agreeable author of the Tales of the Hall tells us,

> "A farmer's daughter, with redundant health,
> With double Lucy's weight and Lucy's wealth,
> Had won the man's regard, and he with her
> Possessed the treasure vulgar minds prefer."
>
> Book XXII.

But does any one therefore seriously believe that this blooming ponderous, and corpulent lady had a greater degree of health than she required, or could spare any either to her husband or any other person? It is almost trifling to remark that the expression is merely a figurative mode of representing a combination of circumstances supposed, often most erroneously, to indicate the external characters of robust health, and which is agreeable to the imagination, because it accords with some of the common notions entertained by mankind. But that there is in it any thing like either matter of fact, truth, or logical or physiological accuracy, no one could ever seriously believe.

But supposing, for the sake of argument, it were admitted that there could be such a thing as an exuberance of health, it next is said, that this can be communicated so as to sustain and repair the deficient vitality of the sick. Now this, we maintain, is so completely contradicted by daily experience, that it must be perfectly idle to attempt to refute so extraordinary an assertion. We would only ask the question, does it ever occur that we can be quite sure of sustaining or even repairing deficient vitality? or is it the fact that when vitality, as it is called, is deficient, it can be repaired? This must also be regarded as one of those vague figurative modes of representing to the imagination ideas which cannot easily be accurately or justly formed. What is vitality, and how is its deficiency shown? We acknowledge that we cannot form any very distinct idea of vitality, apart from the organs and textures of the animal frame; and as its presence appears to depend on the sound structure of these textures and organs, and on the correct performance of their functions, so its abatement, or impairment, or deficiency, is probably connected with change in structure or disorder in function. The term *vitality* is indeed a sort of figurative abstraction, a short mode of expressing the result of the sound state of the organs, and consequently of the whole frame, and the healthy action of these organs, or, in other words, of the functions. The question comes to be, does vitality exist as a separate distinct essence, capable of being transferred from one living body to another? If it do, it may be safely said that we have no means of proving such a proposition, and we must admit it as a mere possible supposition.

The most extraordinary, however, and the least conceivable of all the assumptions promulgated by the author is this, that by the will it is possible to perform the transmission now mentioned of conveying vitality from one living being to another. Of this assumption, we would ask what are the proofs? The power, the influence of the will in all acts called voluntary, we admit. It is quite within the compass of a man's will to do good or to do evil, to live temperately, soberly, virtuously, to resist temptation, to be firm in adhering to that which is right, and to avoid that which is wrong. All this we know is placed under the dominion of his will. But other matters are not so placed. He cannot by his will add one cubit to his stature. He cannot make blue eyes black, or black eyes blue. If his hair be of a glaring red, he cannot convert it to a jet black. He cannot make his heart beat only fifty times if it beats eighty times in the minute. He cannot by his will avert an attack of a fit of gout, a paroxysm of stone, or a fit of apoplexy. How, then, can it be expected that he can transfer vitality from one human body to another? Certainly this can be done neither by wishing nor by willing, that such a transmission shall be accomplished. We know that the will is so constituted that it has no power to do this; and it would require a constitution both of the human mind and also of the corporeal faculties totally different from that which it is at present, to effect such a transmission.

Mr Newnham is anxious to establish the truth and reality of magnetism, as an actual property or faculty of living beings, by appealing to the great number, the high character, and the disinterested feelings of the witnesses. If, he argues, magnetism had been a deception, is it possible to imagine that among the hundred pupils who subscribed to Mesmer for instruction, not one should have detected the delusion; that not one should have published their dupery, especially when invited to do so by the opponents of magnetism in high places; that not one wished to make a fortune by the secret, but that ALL were desirous that the public should benefit; nay, further, that among those who were *most* exasperated by the private conduct of Mesmer, not one was to be found who did not attest that he had made a useful discovery.

It would be indeed wasting a valuable thing to enter into a formal refutation of statements like those now made. Sufficient is it to observe, first, that not all the facts of magnetism are denied; it is only maintained that, while these phenomena must be admitted, they may be explained without having recourse to the hypothesis of magnetism; secondly, that it has been proved over and over again that there is, in the transactions which have from time to time been published as illustrative of magnetism, a great deal of delusion, self-imposition, and general imposition, and a great number of false facts; thirdly, that it is more than doubtful whether the partizans of mesmerism were actuated by no other motive save that of promoting the benefit of the public; and fourthly, that we never heard it mentioned by any person of sound judgment and good information, that Mesmer had made any discovery at all, much less a useful discovery.

The truth is, that the whole subject is so mixed and commingled with a sprinkling of apparent truth, or verisimilitude, and a large amount of transparent falsehood, that it becomes no easy matter to disentangle the one from the other; and when the task is accomplished, the question recurs, is it worth while? is the prize worth the labour? Certainly when there are so many more subjects deserving examination, and promising to reward the labour, it seems but a foolish and unprofitable employment of the human intellect to waste its energies in cultivating a field so barren and unproductive.

The question as to the competency and credibility of the witnesses may be soon disposed of. Every one conversant in such inquiries knows that not every one is competent to act as a witness or evidence in inquiries of this nature; that the task of observing is very arduous and complicated; that many circumstances occur to prevent the ascertainment of the actual facts of the case; and that, in judging of the exact nature of these facts, it by no means follows that they are either new or imply the existence of a new faculty in the mind, or a new function in the body, because the knowledge of those who observe them has been unable to produce analogous or similar facts.

Mr Newnham states, indeed, as an alternative, that the facts referred to mesmerism, if true, must be the result of an ill-understood faculty. We acknowledge that we know not to what the author alludes, when he speaks of an ill-understood faculty; whether he thinks that all the other faculties are very well understood, and that this faculty of magnetopoiesis is alone ill understood. But when he informs his reader that the distinct traces of magnetism are to be found in the recorded literature of India, of the Egyptians, the Jews, the Persians, the Greeks, and the Romans; that they are to be descried in the early ages of Christianity: in the dark and middle ages; at the revival of letters; and they have been resuscitated and explored in modern times, even to our own day; it must be manifest either that this magnetopoietic faculty is just as well understood as the others, or that none of the faculties at all are well understood. We are willing to admit that it would be wrong to assert, that the philosophy of mind and the history of the mental faculties is so complete, that it requires no additional facts and no new illustrations. It is probable that we are very far indeed from this exalted degree of perfection. But it is remarkable, that those only who are least acquainted with the history of pneumatology and metaphysics are constantly talking of the novelties disclosed by the phenomena of mesmerism; while to those well acquainted with these sciences, the phenomena of mesmerism serve merely to illustrate several points already more or less fully known.

Mr Newnham also, we conceive, falls into another mistake as to the nature of the questions at issue, when he argues that the opponents of magnetism have no title to deny the facts of magnetism, merely because these facts are not easily explained. We believe that we state the matter correctly, when we say that the opponents of magnetism do not deny the facts on this ground.

Several of the facts, so far as facts they are, they admit, without saying whether they are explicable or not. They merely refer these facts to certain classes or orders of other facts. But it is well known that many of the alleged facts of magnetism are not facts at all; and it is most certain that a degree of delusion, deceit, and imposition has been practised upon weak and credulous individuals, we do not say unparalleled, but assuredly to be paralleled only by the history of similar great delusions.

It will appear quite superfluous in Mr Newnham to prove that the phenomena of magnetism are not attributable to satanic agency, and equally superfluous to show that they are not supernatural in any sense of the word. If any one ever said that they were to be ascribed to satanic agency, he must have lived at least three centuries too late; and if any one asserted that they were supernatural, he must have lived out of the world altogether.

Mr Newnham is not so blind, with all his inclinations in favour of the reality of this science or doctrine, as not to recognize the truth of the observations now made. The following passages contain admissions as fatal to the justice of the cause as any of its foes could extract.

> " There is an acknowledged difficulty in the onward progress of magnetism, on account of its having been associated with untruth, and with so much error, folly, and enthusiasm, inasmuch as *absolute truths*, which have for a time been opposed, because of their being thus *encumbered*, become more difficult of reception than those which have been previously *altogether unknown*. It is easy to see that, in the first case, the pursuit is one of discovery, where the mind is open to receive impressions, and the knowledge to be derived from them; and that in the other it is a warfare, at the outset of which the mind is bristled in opposition, expecting to meet at every turn an enemy, and that the fairest appearances may serve to decoy the unwary into some impassable defile, or some concealed ambuscade, or some destructive mine ready to explode beneath the feet.
>
> " Thus the cause of magnetism has been prejudiced by those early histories, in which real phenomena were said to have been accompanied by so many incredible circumstances, and were assumed to depend on principles so opposed to the established laws of science, that the unreal and adventitious adjuncts only were remembered, the sober realities were forgotten, and men of learning withdrew from the study, under a nervous apprehension that their reputation would be compromised, and that they would be confounded with the phantoms thus created."—Pp. 56, 57.

This is pretty well. What follows is in no degree less characteristic.

> " Then again, in some instances, the sick were reported cured when they were not cured; others described themselves as cured, who had never had any thing but imaginary malady; and some mag-

netisers promised effects which they could not produce, and then asserted that they had been produced, perhaps sometimes with the intention of deceiving others; oftener, however, they themselves being deceived and led away by the ardour and enthusiasm of the moment. All these things threw discredit on the pursuit; it was asserted that the cures, if established, were no proof that they were consequent on the treatment; and the public seeing only various extraordinary phenomena, thought and spoke of them alone, and altogether forgot the primary, the really exclusive object of magnetism, viz. the relief of malady.

" But the curative object of magnetism being forgotten, there arose, perhaps very naturally, this inference, that since no good was to be effected by these very extraordinary processes, they could only be put forward with some sinister design, and then the shortest method for disposing of the question, was to represent the whole as a system of fraud. Yet the superstition that magnetisers, as a body, have had the intention to deceive, is so utterly at variance with all probability, that it need not be seriously contradicted. The only support which can be obtained for such a supposition is to be found in some scantily furnished negative truths. It is, however, always to be recollected, that a great number of negative proofs are (is) insufficient to destroy, or even to undermine, one well established positive fact."—Pp. 57, 58.

This is merely saying in a manner a little circuitous, that magnetism consists for the most part of false and erroneous facts; that those who practise it are either complete impostors, or very silly, credulous, weak people, who are easily deceived, and that its alleged influence is either naught or most extravagantly overrated. The great and manifest evil, indeed, of magnetism above every other species of delusion is, that it forms the receptacle of all sorts of error, falsehood, and deceit, and that no man can believe in it, or practise it, without partaking in the errors to which it gives rise and upon which it proceeds; without giving up the exercise of his reason and understanding; without taking leave of common sense, and rendering null and void all previous knowledge and all well established principles of human belief.

After the admissions already adverted, it will appear extraordinary that Mr Newnham could draw conclusions like the following:

" In reality, magnetism in its origin is guiltless of any moral injury to society; (indeed !); its only evil has been that of slightly deranging the tendency of the age whose great leaning has been towards materialism; and of interfering with the pretensions of some selfish pseudo-philosophers, who claimed to have reached the utmost boundaries of science, and therefore could not tolerate the supposed existence of valuable knowledge beyond their own acquirements."

This is not a bad specimen of the kind of argumentation pursued towards those who are not disposed to admit the pretensions of magnetism. First of all it is said, magnetism is guiltless of any moral injury to society; as if it were no moral injury to propagate as true and well established, a very considerable number of errors and falsehoods; as if there were no immorality in rendering men and women deceivers and impostors. Next comes the charge of materialism, as if magnetism itself were not most favourable to the doctrines of that hypothesis; or as if it were at all favourable to spiritualism. Then all the opponents of magnetism are charged in a body with selfishness, conceit, and presumption. It is easy to see that, amidst assertions so rash and charges so sweeping, it is impossible to expect either dispassionate inquiry or sound reasoning.

Mr Newnham is displeased that medical men have opposed the doctrines and rejected the facts of magnetism; and he calls on them to investigate the subject, and invoke its aid in the cure of diseases. To induce them to do so he informs them that

> "Magnetism rests on a great number of real, or at least of probable facts:—but its adversaries have generally avoided the real question, and have preferred wasting their strength upon speculations as to the nature, rather than as to the phenomena and effects of magnetic processes. When, however, men of learning, of character, of honour, of high probity and professional standing,—men who have no interest to deceive and everything to lose by dishonesty; when men of such character attest the same facts from one end of Europe to the other, when they describe the same circumstances, and detail similar phenomena, how is it possible to throw the blight of wilful doubt upon their assertions? how is it that medical men generally do so tacitly asperse their own fraternity, as they must necessarily do by refusing to inquire? True it is that a great surgeon once said in disparagement of medical authority, MEDICAL FACTS! MEDICAL LIES. But John Hunter was not a man well calculated to form a just estimate of professional testimony; the doctrines he propounded were not at first sight admitted, and his unhappy irascible temperament was easily ruffled and irritated by opposition, and it was in one of these moments that he uttered the bitter and unjust sarcasm above detailed. But were it as true, as it is unquestionably an exaggeration, it would not give to the medical men of the present day a *locus pœnitentiæ* for their treatment of the question of magnetism, since this also rests its truth on the testimony of the simple-hearted, unlearned, unprejudiced, and unsophisticated observer, as well as on the finer drawn observations and reasonings of professional and other learned persons."—P. 75.

We have reason to fear, from the manner in which Mr Newnham here expresses himself, that he is not in a very proper mood to receive any views or opinions at variance with his own, or which may imply that his own views are not well founded. But to us it appears that he mistakes the whole question at issue, and that all his reasonings and speculations are vitiated by this mistake. We do not regard the arguments or remarks now made as deserving any serious answer, much less any refutation. They in a great measure refute themselves. We should like to know the number of real facts, and the number even of probable facts, which is a contradiction in terms, as a probable fact is no fact at all, on which magnetism rests. We should be glad also to know the number of men of character, honour, high probity, and professional standing, by whom the truth and validity of these facts have been attested. As to the assertion of Mr Hunter, though it is strongly stated, it is substantially correct; and its correctness does not depend on the character of medical observers so much as on the nature of medical facts. There is no doubt that there are such things as medical facts; but the difficulty is to get at them; and from their very nature they are so involved in doubt and mystery, so equivocal and variable, that it scarcely implies a censure on these observers, that they are not in all cases correctly and faithfully given. If Mr Newnham's own experience has not enabled him to see and understand this, it is no fault of ours.

It is, however, unnecessary to follow the author through all the ramifications of his reasonings and meditations in favour of human magnetism and against its opponents. We have a chapter on objections to, and difficulties in the way of, magnetism; which may be studied by all who desire to know these objections and difficulties. Then follows a chapter on the applicability of magnetism to the relief of medical and surgical disease, which gives much the same kind of facts and illustrations which have been usually adduced on this subject. Then follows a short chapter on the qualifications of magnetisers, from which it may be inferred that the author entertains on the character of these performers ideas as fanciful, as those of the most accomplished *visionnaires* and fanatics that ever existed. After telling his reader that a seance is followed by a good deal of exhaustion, and a feeling of weariness and fatigue, he accounts for this by adding, that "there is diminished vitality from its too rapid expenditure;—the magnetiser has lived in two individuals at the same time, and has imparted of his own vital power to sustain that of the invalid,—and thus experiences the necessary consequence of having parted with what he has the power to recruit, in order to succour the deficient vitality of one whose power to recruit has been lost by sickness."—P. 148. Either all this must be supposed to be the figurative language peculiar to poets and other imaginative persons, or the author must form the most extraordinary notions of the credulity and simplicity of his readers. Does he seriously and really expect mankind to believe, that John can live in John and James at the same time?

Next follows a chapter in which the author examines at some length the conduct of the Royal Academy of Medicine, in regard to animal magnetism, contrasting the two reports of 1784 and

1826, and showing from their discordance, and especially from the reluctant admissions of the second, several of which were opposed to those of the first report, that magnetism is in its fundamental characters and principles a true science. He then notices the Inquiry of 1837, which gave rise to several strictures from M. D. Husson, and is led from this and the case of Mademoiselle Pigeaire, to consider the influence of the imagination in the production of magnetic phenomena. His views on this part of this subject are comprehended in the following passages.

" But magnetic effects *have been* attributed to *imagination*. By this term, however, is not intended that brilliant poetical faculty which traces invisible and intangible objects, with a pencil and a colouring far more vivid than reality;—which does not, strictly speaking, create new objects, but which, in its own ideal world, discovers relationships between different things, which are unperceived by the general sense of dull mortality,—and traces ingenious combinations,—and invests them with a hue of brightness and of cheerfulness, on the one hand,—or of sombre dulness, and of shadowy futurity on the other. This is certainly a mental condition, though, of course, its manifestation is dependent upon brain. But, in the sense in which imagination has been employed as the agent in producing magnetic phenomena, the idea involves a peculiar feebleness of the nervous system, which renders it unduly susceptible to all kinds of impression.

" Even in this low and corporeal exercise of the faculty, it is not imagination which *produces* magnetic effects, though it is allowed that this condition may render the brain more susceptible to their influence, because it is the very state, which it is intended to remove by its healing agency. We consider, therefore, that magnetism, in its origin and its effects, involves a *peculiar condition* of the nervous system;—and that it is *as such* that it ought to be considered and studied. And yet, admitting so much, we must contend for it, as being a question of *secondary* importance:—the *primary* question is, has the relief been obtained?— the *secondary* question only, *in what* way has it been effected?

" In attempting to explain surprising cases by the influence of imagination, the advocates of this cause, in their haste to extinguish magnetism, forget that the influence of the former is not a whit less difficult to trace up to its cause, or through all the labyrinths of its agency, *than is the latter*. The term itself is undefined; and, even in the limited sense in which we have employed it above, for the sake of simplifying the argument, we are left to the conclusion, that it is a *something* invested with extraordinary powers, in a certain condition of that body—but what that something is, we are still left to ascertain. Therefore, the advocates of imagination, *who do not deny the effects produced*, but simply refer them to another cause, have only shifted the difficulty, from an ill-understood, to a less understood original.

" We have said that the effects are *admitted*;—and we must be allowed to ask, how it happens, that a simple magnetiser, possessing the properties above mentioned—who makes no ostentatious pretensions,—who promises nothing,—who merely places his hand upon the stomach, or makes some slight frictions, of the design of all which the patient is unconscious, and has never heard or read:—how it happens, that he yet produces a more decidedly curative effect, than all the remedies of some physician of high eminence and renown,—on whom the patient's hopes and expectations have been centered,—whose visit has been most anxiously expected,—in whose judgment and intelligence, the surest reliance has been placed,—and whose medicines have been duly taken—and all his plans most religiously adhered to, with an unshaken confidence of deriving benefit from them. Here the imagination has been excited to the utmost,—and yet the effect has not been comparable with the *former* influence,—and this, to make the case still stronger, even when that influence has been exerted upon persons, who were not even neutral,—but who were very doubtful as to the utility of magnetism. This argument proceeds upon the supposed admission of the facts:—if these are denied, then there is *no truth* in the world,—and there is an end of argument:—*if allowed,* the cause of cure must be sought *in some other agent* than imagination.

"The term *imagination* has here been a convenient one, employed for the simple purpose of alleging a *cause* other than magnetism, for *effects* which are indisputable:—and of concealing ignorance of that cause, of which we really know nothing. It is an attempt to explain that which is inexplicable;—and to substitute one term whose qualities are unknown, for another whose qualities are equally unknown. And what is gained? The facts are *established* by the supposition; the mode of accounting for them is changed,—but changed without a shadow of philosophical truth. What is still worse, is, that the parties so employing this term, know not and have never even considered its meaning, or its applicability. And to take only the lowest ground, it is surely impossible to explain by this supposed cause, effects produced upon patients who had no cognisance—not even a suspicion, that anything was going forward in their particular case, and who were entirely ignorant of the whole doctrine. If the assertion be then persisted in we accept it with all joy, because it proves too much; —inasmuch as. if *imagination* has been excited under such circumstances, it must have been so excited by some *unknown cause;* and as magnetism is the only recognised agent, the probability comes out, that it must have been so excited by *magnetism,* thus giving up the point in dispute:—for if this cause be magnetism, opposition is at once destroyed:—if it be any other cause, this cause requires and demands investigation.

"It does not however appear to us, that the imagination of the *magnetised,* does contribute in any way to the magnetic effects, as such. It is not therefore denied, that imagination may exercise a considerable influence on magnetic phenomena:—but then it is the imagination of the *magnetiser,* not of the *magnetised,*—a fact which proves the *power,* rather than impugns the *reality* of magnetism.

"It is however readily allowed, that *this faculty, thus exercised,* may produce untrue results by influencing the clairvoyant individual to perceive things through the medium of their excited organs. Perhaps this is the best method of explaining the reports of somnambulists, who have departed from the simple soundness of truth, and have wandered without rudder or compass into regions of ideality, and have given reports which are deprived even of vraisemblance.

"This idea is supported by the fact, that during clairvoyance, *no knowledge is elicited,* no opinion given, *not previously possessed* by the magnetiser or magnetised,—at least in its germ, if not in its development. For instance, a Turkish somnambulist will never give *Christian views or opinions, unless the magnetiser be a Christian.*

"It is then admitted that certain phenomena are the consequence of the exaltation of the imaginative faculty:—but then it is to be recollected that it is *magnetism* which has occasioned this exaltation; a state which may, under different circumstances, exist *naturally,* or be produced by a variety of other causes.

"In this way, however, a state of extatic delirium may arise,—in which a chimerical idea once introduced into the brain, may prove the *idée mère* of many illusions and reveries of an unreal character. In this state the imagination is unnaturally exalted, and the patient is not to be *trusted.* It is quite possible to become the *dupe* of these reveries; but the danger will become less in proportion as investigation advances,—and will be entirely dissipated, when wise medical men shall superintend and direct the treatment; and when advancing knowledge on psychological subjects shall have enabled us to contrast and to compare these *extraordinary* phenomena, with the more simple laws of the human *understanding.*

"Finally, admitting that those who were cured, were so cured, through the medium of their imagination;—still, they who have discovered this method of so exciting the imagination, as to render such excitement curative of any intractable malady, have done much; —and must be entitled to at least *equal credit* with those who had conducted the unsuccessful treatment, or even with those who might carry on the treatment to a successful issue, by means more hurtful to the constitution."—Pp. 196–201.

Now the great beauty of the whole of these observations is, that the main point of the whole question is here completely kept out of view. Unquestionably magnetic phenomena and effects have been ascribed to the influence of imagination; but certainly it is not that sort of influence which distinguishes either the great poet or the great philosopher. Imagination is one of the most important and essential faculties in all mental operations. But is also one most liable to disorder and irregularity, and requires especially to be guided and regulated by other faculties. It is not less necessary to the mathematician and to the historian than it is to the poet. But it must be imagination in its healthy and vigorous state, regulated by reason, chastened by judgment and observation, enlarged, stored, and fortified by knowledge, and rectified by constant intercourse with mankind and the world. When Homer wrote the Iliad, though he could not have either conceived or executed that immortal poem without the aid of imagination, yet imagination alone could never have enabled him to produce so exquisite a performance. There was immense and accurate knowledge of many facts, of all the springs and motives of human action, accurate knowledge of the varieties of human character, unbounded knowledge of the state of society, of the manners of mankind, of the geography of the world as then inhabited; and all this knowledge was modelled into such a degree of verisimilitude, that many persons have doubted whether it is a work of fiction or reality. Yet all the pictures of the different scenes, and all the disputes of the chiefs and battles of the opposing hosts, the whole of the interposition of the gods, must have been composed by the aid of the imagination.

The difference is this, that in magnetism it is the morbid deranged imagination that is the great agent of the phenomena. These phenomena are very similar to the confused, wild, and extravagant images presented in the dreams of a sick man, whose whole circulation and nervous system are in an unhealthy state. No person in whom the imagination is in the subdued and subordinate condition of health ever becomes magnetic. No person ever is the subject of magnetic phenomena in whom the imagination is not previously disordered, commonly with some morbid susceptibility of the nervous system.

The author next adverts to the opinion of Chardel, that light is the principle of life; and this, he thinks, is established, or at least rendered most probable by the influence of the solar rays on the metallic salts and other bodies, as shown by Daguerreotype sketches. To the cause of these changes, which have been erroneously ascribed to light, he applies, like Chardel, the term *energeia*, and Mr Hunt that of actinism (*ακτις, ακτινος*, a ray.)

Magnetism, as exhibited in peculiar phenomena on the human frame, embraces the phenomena of four different states, which are distinguished by most authors into, *first*, somnambulism, or the magnetic sleep; *secondly*, clairvoyance, or the faculty of seeing objects while the eyes are completely closed, and seeing them either by the epigastrium or the tips of the fingers, or some other sensible part of the body; *thirdly*, prevision or foresight, or the alleged power of foreseeing events that are to take place; and *fourthly*, ecstasis, or ecstasy, or that state of exaltation of the faculties in which the individual takes no cognizance of the affairs or persons of this world, but at least appears to carry on all his thoughts with the world of spirits.

I. The nature of somnambulism and clairvoyance, so far as these states can be understood, are perhaps sufficiently known. At all events their beginning, approach, their course and terminations are understood as well as they are likely to be. If any one wishes more full information than has yet been given the English reader on these subjects, he will do well to peruse the chapter in the present work, which certainly contains a good selection of facts and illustrations. The chief question which these cases suggest is, whether the answers given to the questions proposed were not mere fortunate conjectures, or whether, in other cases, they were not procured by the knowledge or information of the parties? All of us know what happy guesses are made by professed fortune-tellers and conjurors; and all of us know how much these persons can turn to account their natural sagacity; their knowledge of the circumstances of the consultants, and their power of divining their wishes, their hopes, and their fears. As to the story of the young woman, the clairvoyant somnambulist of the Alton paper mills, we see in her answers and whole conduct nothing which could not be paralleled in several cases which we have known or witnessed, but which we do not think proved any thing beyond mere fortunate guesses amidst multiplied errors.

II. To the head of clairvoyance, or, as it is by some termed, lucidity, belongs the pretended faculty of possessing an intuitive knowledge of disease and the required remedies, and the alleged faculty of seeing where they are transacted, distant actions and events. The magnetised individual is represented and pretends, while before us, to know and see actions and events, which take place at the distance, not merely of yards but of miles. As the magnetic philosophers have, among their other indications of the love of the marvellous and supernatural, shown a particular predilection for the maintenance of this faculty, they have collected examples more or less pointed, and in their estimation, fitted to establish the principle for which they contend. Mr Newnham has dealt in a small degree in this way; and it is evident that he believes in the truth of the assumption. Other authors have also recorded cases calculated to establish the same inferences. All, however, have been received with more or less incredulousness and doubt; and in general the correctness of the statements have been positively denied as originating either in imposition or some mere accidental coincidence between the events and the alleged account of the magnetic observer.

No person, in this state of the question, has come forward in a manner so confident and with such strong claims on the attention of the public as Miss Martineau, who in the second of her letters represents a young female of nineteen years, to have given evidence that she was not only, when magnetised, possessed of a knowledge of medicine and astronomy, but could tell certain events going on far from the place of her residence. Here is the case:

"J. had for six years been subject to frequent severe pain in the left temple, and perpetually recurring inflammation of the eyes, with much disorder besides. She is active and stirring in her habits, patient and cheerful in illness, and disposed to make the least, rather than the most, of her complaints. She had, during these six years, been under the care of several doctors, and was at one time a patient at the Eye Infirmary at Newcastle; and the severe treatment she has undergone is melancholy to think of, when most of it appears to have been almost or entirely in vain. She herself assigns, in the trance, a structural defect as the cause of her ailments, which will prevent their ever being entirely removed; but, from the beginning of the mesmeric treatment, her health and looks have so greatly improved, that her acquaintance in the neighbourhood stop her to ask how it is that her appearance is so amended. There was in her case certainly no 'imagination' to begin with; for she was wholly ignorant of mesmerism, and had no more conception of the phenomena she was about to manifest than she has consciousness of them at this moment.

"This unconsciousness we have guarded with the utmost care. We immediately resolved that, if possible, there should be one case of which no one could honestly say that the sleeping and waking states of mind were mixed. Our object has been, thus far, completely attained,—one harmless exception only having occurred. This was when, speaking of the nature and destiny of man, an idea which she 'had heard in church,' intruded itself among some otherwise derived, and troubled her by the admixture. On that occasion, she remarked afterwards, that she had been dreaming, and, she thought, talking of the soul and the day of judgment. This is the only instance of her retaining any trace of anything being said or done in the trance. Her surprize on two or three occasions, at finding herself, on awaking, in a different chair from the one she went to sleep in, must show her that she has walked; but we have every evidence from her reception of what we say to her, and from her ignorance of things of which she had previously informed us, that the time of her mesmeric sleep is afterwards an absolute blank to her. I asked her one evening lately, when she was in the deep sleep, what she would think of my publishing an account of her experience with my own,—whether she should be vexed by it. She replied that she should like it very much: she hoped somebody would let her know of it, and show it to her,—for, though she remembered when asleep everything she had thought when asleep before, she could not keep any of it till she awoke. It was all regularly 'blown away.' But if it was printed, she should know; and she should like that.

"To preserve this unconsciousness as long as possible, we have admitted no person whatever at our *séances*, from the first day till now, who could speak to her on the subject. We shut out our maids at once; and we two have been the constant witnesses, with a visitor now and then, to the number of about twelve in the whole.

"It is a memorable moment when one first hears the monosyllable, which tells that the true mesmeric trance has begun—'Are you asleep?' 'YES.' It is crossing the threshold of a new region of observation of human nature. Then it goes on. 'How long shall you sleep?' 'Half an hour.'—'Shall you wake of yourself, or shall I wake you?' 'I shall wake of myself.'—And so she did to a second, no clock or watch being near, but the watch in my hand. For some weeks she could always see the time, and foretell her own waking; but of late, in manifesting some new capabilities, she has lost much of this.

"Nothing can induce her to say a word on a matter she is not perfectly sure of. She solemnly shakes her head saying, 'I won't guess:—it won't do to guess.' And sometimes, appealingly, 'I would tell you if I could.' 'I'll try to see.' 'I'll do all I can,' &c. When sure of her point, nothing can move her from her declarations. Night after night, week after week, she sticks to her decisions, strangely enough sometimes, as it appears to us; but we are not aware of her ever yet having been mistaken on any point on which she has declared herself. We ascribe this to our having carefully kept apart the waking and sleeping ideas; for it is rare to find somnambules whose declarations can be at all confidently relied on. If any waking consciousness is mixed up with their sleeping faculties, they are apt to guess—to amuse their fancy, and to say anything that they think will best please their mesmerist. J.'s strict and uncompromising truthfulness forms a striking contrast with the vagaries of hackneyed, and otherwise mismanaged somnambules."

Then comes the knowledge of pathology and therapeutics.

"It soon became evident that one of her strongest powers was the discernment of disease, its condition and remedies. She cleared up her own case first, prescribing for herself very fluently. It was curious to see, on her awaking, the deference and obedience with which she received from us the prescriptions with which she herself had just furnished us. They succeeded; and so did similar efforts on my behalf. I cannot here detail the wonderful accuracy with which she related, without any possible knowledge of my life ten and twenty years ago, the circumstances of the origin and progress of my ill-health, of the unavailing use of medical treatment for five years, and the operation of Mesmerism upon it of late. One little fact will serve our present purpose better. Soon after she was first mesmerised, I was undergoing my final severance from opiates—a serious matter to one who had depended so long and so desperately upon them. As I have said, I got through the day pretty well; but the nights were intolerable, from pain and nervous irritations, which made it impossible to rest for two minutes together. After four such nights, I believe my Mesmerist's fortitude and my own would have given way together, and we should have brought the laudanum bottle to light again, but for the bright idea, 'Let us ask J.!' She said at once what my sufferings had been, and declared that I should sleep more and more by degrees, if I took—(what was as contrary to her own ordinary ideas of what is right and rational as to mine)—ale at dinner, and half a wine-glassful of brandy in water at night. I refused the prescription till reminded —'Remember she has never been wrong.' I obeyed; the fact being kept secret between us two, in order to try, every evening, J.'s knowledge and opinion. She always spoke and advised, in a confident familiarity with incidents known only to us two, and carried me steadily through the struggle. I lost my miseries, and recovered my sleep, night by night, till, at the end of the week, I was quite well, without stimulant or sedative. Nothing can be more remote from J.'s ordinary knowledge and thought than the structure of the human body, and the remedies for disease; and, though I was well aware how common the exercise of this kind of insight is in somnambules—how it is used abroad as an auxiliary to medical treatment—I was not the less surprised by the readiness and peremptoriness with which a person, in J.'s position, declared, and gave directions about things which she is wholly ignorant of an hour after, and was, during the whole of her life before."—Pp. 22–24.

Then follows a specimen of the new magnetic philosophy, in which words are substituted for facts and ideas.

"It is almost an established opinion among some of the wisest students of Mesmerism, that the mind of the somnambule mirrors that of the Mesmerist. Of course, this explains nothing of the operation of Mesmerism; but it is a supposition most important to be established or disproved. One naturally wishes to find it true, as it disposes of much that, with the hasty, passes for revelation of other unseen things than those which lie in another person's mind. It certainly is true to a considerable extent, as is pretty clearly proved when an ignorant child—ignorant, especially, of the Bible—discourses of the Scriptures and divinity when mesmerised by a clergyman, and of the nebulæ when mesmerised by an astronomer; but we have evidence in J. that this is, though often, not universally true. I will give an example of each:—

"On Saturday, October 12, she had told us that she now 'saw the shades of things' that she wanted to know, and that she should 'soon see clearer.' The next evening, she went into a great rapture about the 'gleams' becoming brighter, so that she should soon see all she wished. The light came through the brain,—not like sunlight, nor moonlight;—'No, there is no light on earth like this:' the knowledge she got 'comes astonishingly,—amazingly,—so pleasantly!' 'How is the mesmerising done which causes this?'—'By all the powers at once.'—'What powers?'—'The soul, and the mind, and the vital powers of the body.' Then, as we inquired —'The mind is not the same as the soul. All are required in mesmerising, but the mind most, though Mesmerism is still something else.'—'Those three things exist in every human being, (the soul, the mind, and the body,) separate from one another; but the faculties belonging to them are not the same in everybody; some have more, some less. The body dies, and the mind dies with it; but the soul lives after it. The soul is independent and self-existent, and therefore lives for ever. It depends upon nothing.'

"Here I prompted the question, 'What, then, is its relation to God?' She hastily replied, 'He takes care of it, to reunite it with the body at the day of judgment.' Here I was forcibly and painfully struck with the incompatibility of the former and latter saying, not (as I hope it is needless to explain) from any waiting on her lips for revelations on this class of subjects, but because it was painful to find her faculties working faultily. As I felt this disappointment come over me, an expression of trouble disturbed J.'s face, so ineffably happy always during her sleep. 'Stop,' said she, 'I am not sure about that last. All I said before was true—the real *mesmeric* truth. But I can't make out about that last: I heard it when I was awake,—I heard it in church,—that all the particles of our bodies, however they may be scattered, will be gathered together at the day of judgment; but I am not sure.' And she became excited, saying that 'it bothered her,' what she knew and what she had heard being mixed up. Her mesmerist dispersed that set of ideas, and she was presently happy again, talking of 'the lights.' This was the occasion on which some traces remained in her waking state, and she told a fellow-servant that she had been dreaming and talking about the day of judgment.

"Now here her mind seemed to reflect those of both her companions, (though I was not aware of being *en rapport* with her.) Her Mesmerist had it in her mind that a somnambule at Cheltenham had declared man to consist of three elements; and J.'s trouble at her own mingling of ideas from two sources seems to have been an immediate echo of mine. Such an incident as this shows how watchful the reason should be over such phenomena, and explains the rise of many pretensions to inspiration. It requires some self-control for the most philosophical to look on a person of moderate capabilities and confined education, in the attitude of sleep, unaware of passing incidents, but speaking on high subjects with an animated delight exceeding anything witnessed in ordinary life;—it requires some coolness and command of self to remember that what is said may be of no authority as truth, however valuable as manifestation."—Pp. 24–26.

Next follows the great example of magnetic lucidity or phaneropism, and which has been destined to become one of the most important *observationes crucis* of magnetism that has yet been adduced. This young female, indeed, passes at once from the character of an intuitive pathologist and physician to that of a telescopic phaneropist on the most extensive scale.

"On the next occasion," says Miss Martineau, "she uttered what could not possibly be in the mind of any one of the four persons present. The anecdote is so inexplicable, that I should not give it but for my conviction that it is right to relate the most striking facts that come under my observation, positively declining to theorise. My friend and I have used every means of ascertaining the truth in this instance; and we cannot discover any chink through which deception or mistake can have crept in, even if the somnambule had been a stranger, instead of one whose integrity is well known to us.

"The next evening (Monday, October 14th) J. did not come as usual to our *séance.* There was affliction in the household. An aunt (by marriage) of J.'s, Mrs A., a good woman I have long known, lives in a cottage at the bottom of our garden. Mrs A.'s son, J.'s cousin, was one of the crew of a vessel which was this evening reported to have been wrecked near Hull. This was all that was known, except that the owner was gone to Hull to see about it. J. was about to walk to Shields with a companion to inquire, but the night was so tempestuous, and it was so evident that no news could be obtained, that she was persuaded not to go. But she was too much disturbed to think of being mesmerised. Next morning there was no news. All day there were flying reports,—that all hands were lost—that all were saved—but nothing like what afterwards proved to be the truth. In the afternoon (no tidings having arrived) we went for a long drive, and took J. with us. She was with us, in another direction, till tea-time; and then, on our return, there were still no tidings; but Mrs A. was gone to Shields to inquire, and if letters had come, she would bring the news in the evening. J. went out on an errand while we were at tea,—no person in the place having then any means of knowing about the wreck; and on her return, she came straight up to us for her *séance.* Two gentlemen were with us that evening, one from America, the other from the neighbourhood. I may say here that we noted down at the moment what J. said; and that on this evening there was the additional security of my American friend repeating to me, on the instant, (on account of my deafness,) every word as it fell.

"J. was presently asleep, and her Mesmerist, knowing the advantage of introducing subjects on which the mind had previously been excited, and how the inspiration follows the course of the affections, asked, as soon as the sleep was deep enough, 'Can you tell us about the wreck?' J. tranquilly replied, 'Oh! yes; they're all safe; but the ship is all to pieces.'

"'Were they saved in their boat?'

"'No, that's all to pieces.'

"'How then?'

"'A queer boat took them off; not their boat.'

"'Are you sure they are all safe?'

"'Yes; all that were on board; but there *was* a boy killed. But I don't think it is my cousin.'

"'At the time of the wreck?'

"'No, before the storm.'

"'How did it happen?'

"'By a fall.'

"'Down the hatchways, or how?'

"'No, he fell through the rigging, from the mast.'

"She presently observed, 'My aunt is below, telling them all about it, and I shall hear it when I go down.'

"My rooms being a selection from two houses, this 'below' meant two stories lower in the next house.

"She continued talking of other things for an hour longer, and before she awoke the gentlemen were gone. After inquiring whether she was refreshed by her sleep, and whether she had dreamed, ('No,') we desired her to let us know if she heard news of the wreck; and she promised, in all simplicity, that she would. In another quarter of an hour, up she came, all animation, to tell us that her cousin and all the crew were safe, her aunt having returned from Shields with the news. The wreck had occurred between Elsinore and Gottenberg, and the crew had been taken off by a fishing boat, after twenty-four hours spent on the wreck, their own boat having gone to pieces. She was turning away to leave the room, when she was asked,—

"'So all are saved—all who left the port?'

"'No, ma'am,' said she, 'all who were on board at the time: but they had had an accident before;—a boy fell from the mast, and was killed on the deck.'

"Besides having no doubt of the rectitude of the girl, we knew that she had not seen her aunt,—the only person from whom tidings could have been obtained. But, to make all sure, I made an errand to the cottage the next morning, well knowing that the relieved mother would pour out her whole tale. My friend and I encouraged her; and she told us how she got the news, and when she brought it to Tynemouth,—just as we knew before. 'How glad they must have been to see you 'at ours'!' said I.'

"'O yes, ma'am:' and she declared my landlady's delight.

"'And J.,' said I.

"'Ma'am, I did not see J.' said she, simply and rapidly, in her eagerness to tell. Then, presently,—'They told me, ma'am, that J. was up stairs with you.'

"Two evenings afterwards, J. was asked, when in the sleep, whether she knew what she related to us by seeing her aunt telling the people below? to which she replied, 'No, I saw the place and the people themselves,—like a vision.'

"Such was her own idea, whatever may be the conjectures of others."

To this story, and the drama which it represents, great importance was attached, both by Miss Martineau and her friends, and the advocates of magnetism; and in their eagerness to propound it as a proof of the truth of the phaneropic faculty of the magnetic state, they seem totally to have overlooked the slender foundation on which it rested, and the deception which assuredly it carried in its construction. Even a suspicion of the veracity and the sincerity of the phaneropist might have arisen from an admission by herself, as given by Miss Martineau. "She presently observed, 'My aunt is below telling them all about it, and I shall hear it when I go down."

In the article in last Number, (at p. 406,) in reference to this and similar alleged cases of phaneropism, we found it requisite to say, that, "when such claims are made, it may be regarded as certain that a great deal of deception is practised;" and that "the clairvoyants had been detected in numerous blunders, and will be detected in many more." This we asserted from mere general knowledge of the character of the magnetic pretenders. The ink was scarcely dry, when the prediction, if prediction that could be called, which was an application of the usual principles of reasoning, was verified and confirmed.

Fortunately, indeed, for the cause of truth and common sense, a complete and satisfactory exposure of the whole imposition was in preparation, and has been since published. Dr Forbes of London being impressed with the belief that J. Arrowsmith had procured the information, which she seemed to possess, in a human or ordinary manner, applied to Dr Brown of Bishopwearmouth to procure, if possible, correct and positive information as to the channel through which this girl had received her intelligence. This task Dr Brown accomplished in a manner that must be satisfactory to all, and the result he communicated in the following letter to Dr Forbes, and statement, both of which were published in the Athenæum for the 15th of March 1845.

"Mrs Halliday is mistress of the house in the High Street, Tynemouth, in which Miss Martineau lodged. She is aunt to Jane Arrowsmith, an orphan, who lives in the house with her, and assists her in taking care of it. An uncle and another aunt of Jane Arrowsmith's, and of the same name (Arrowsmith,) occupy a small cottage at the bottom of the little garden or court, not above twenty yards long, behind Mrs Halliday's house. On the Monday, the day preceding the mesmeric *séance,* intelligence was brought to Mrs Arrowsmith's that the vessel in which her son sailed was wrecked. She was at Newcastle, and did not herself receive the news till she returned home late at night. She went on the following day to Shields to learn particulars from the owner of the vessel, and from him got those particulars—of the total wreck of the ship, of the saving of the crew by a foreign boat, of the drowning of the sailor-boy some time previously, and the safety of all present during the shipwreck,—which are set forth in Miss Martineau's communication to the *Athenæum,* and where the basis of Jane Arrowsmith's (J.'s) mesmeric revelations. Mrs Arrowsmith returned, with the joyful tidings of the safety of her son, between five and six o'clock in the afternoon, and then went *immediately* to her sister, Mrs Halliday, to impart them to her. Jane Arrowsmith was in her aunt Halliday's house when Mrs Arrowsmith told the tale, but not in the kitchen, where it was told to Mrs H. and the other persons there. A person present when Mrs Arrowsmith narrated her tale to Mrs Halliday, told me that the circumstances of it were the subject of conversation in the kitchen, in the interval between its communication there and the mesmeric exhibition, and that *such conversation took place in Jane's presence.* There was an *interval of about three hours* between the bringing of the news to Mrs Halliday's and the *séance*, the one having taken place between five and six o'clock, the other eighteen minutes past eight, according to the information of a gentleman who was present at it, and who took notes of what passed there. The statement of the time of the arrival of the detailed information at Tynemouth and at Mrs Halliday's house, *I had from Mrs Arrowsmith, confirmed by Mrs Halliday.* Jane Arrowsmith (Miss Martineau's J.) denied to me that she had a knowledge of the *particulars* of the wreck prior to the *séance.* What reliance is to be placed on this declaration I leave to the decision of others, with the remark, that if she, a girl of nineteen, evidently of good understanding and of much natural acuteness, did remain for so long a period ignorant of facts which must have been of much interest to her (for the life or death of her own cousin was involved in them)—which had been discussed in her presence—which were perfectly well known, not only to her relations immediately around her, but, within the period, to almost every human being in the little village of Tynemouth,—then was as great a marvel effected in her person, as when, in her sibylline condition, she revealed those same facts without having herself received them through any of the ordinary channels of human information. If, then, her veracity is to be implicitly relied on, we are compelled to conclude that two miracles were in one day accomplished in her person.

"The gentleman already referred to as having been present at the *séance*, was with me when I held the conversation with the parties mentioned. I hope to be able to send you a communication from him respecting that *séance* by to-morrow's post.

"J. Brown.

"Bishopwearmouth, March 10, 1845."

"Tynemouth, March 10, 1845.

"I saw Mrs Arrowsmith again to-day, and questioned her further. She spoke more decidedly than yesterday, and expressed her firm assurance that Jane must have heard all the particulars of the shipwreck at least three hours before her mesmeric revelation of it. She also informed me that she knows *Mrs W.* (Miss Martineau's lady-mesmerist) to have parted with her maid in consequence of the latter having twitted Jane with this foreknowledge, and also expressed her opinion to her mistress on the subject in very decided terms. I forgot to mention yesterday that the letter—the only one received—containing the full particulars of the wreck of the *Henry*, and loss of the boy, a short time after leaving England, was received by the owner of the vessel, a resident in Shields, on Sunday, the 13th day of October, and therefore the whole of the particulars were well known in the neighbourhood on the Monday, although it does not appear that the Arrowsmiths were acquainted with them until Tuesday.

"It is worthy of remark, that the proposal to inquire about the shipwreck, on the evening of the famous *séance*, was made by *Mrs W.* herself, shortly after its commencement; that Mrs W. *did not take tea with* Miss Martineau, Mr —— (the American gentleman) and myself, *but only made her appearance at the same time with Jane*, a quarter past 8 P. M.; and that immediately after Jane had given the statement contained in the *Athenæum*, Mrs W. claimed it as an indubitable proof of the truths of Mesmerism: and at different times, subsequently, during the course of the evening, asked if it was not convincing, and appeared very evidently displeased because I expressed my conviction that Jane had divulged no fact she had not acquired through ordinary sources of information,—at the same time allowing, that *if she could prove* J.'s entire ignorance of the circumstances before entering that room, it would induce me to consider Mesmerism much more worth investigation. * *

"Jane having, in answer to a question suggested by myself, informed me that although deaf people could not hear, blind people could see, and that she herself could see with her eyes shut in the mesmeric sleep, I presented my hand with a silver lancet-case in it before her, but she could not tell what it was. Mr C. next drew out his watch with a heavy gold chain and seals attached, and passed it to Mrs W. behind Jane's chair: in doing so, the chain rattled, and on a signal from myself, the watch was exchanged for a half-crown, which Jane immediately declared to be something round *like a watch.* Mrs W. then applied it close to the back of the head, and afterwards laid it flat on the top of Jane's head, but she still declared it *to be a watch*, or something round like a watch —at one time using the former mode of expression, and at another (when pressed by Mrs W. to try again) using the latter.

"One of the questions asked Jane was, what Miss Martineau should have for supper? and she replied, 'Miss Martineau will not require brandy in her sago to-night.' This drew forth from Miss Martineau and her mesmerist an exclamation of great surprise. How could J. know there was brandy in the sago last night?—When I laughed at this marvel, and suggested the possibility of her having seen the little dish prepared, or at least might have known from another sense that brandy had been used, I was told, with great earnestness by Mrs W., that all down stairs were *sworn* to secrecy, and she was certain they would divulge nothing— not even the important circumstance that Miss Martineau had had a spoonful of brandy in her sago for supper the night before!

"A few minutes after Jane was said to be in the mesmeric sleep, we were informed by Mrs W., in the ordinary tone of conversation, and in the presence of Jane, that, whilst in a state of somnambulism J. could not understand anything spoken by those around her, —even by Mrs W., unless when the latter addressed herself specially to Jane. And, in full reliance upon this inability to hear what was said, Miss M. and the mesmerist *openly discussed the questions to be asked, &c.*, during the whole of the evening." * *

The facts here communicated must be perfectly conclusive to any one whose mind is free from prejudice, and ready to be guided by the evidence of facts. It is true that in the Athenæum of 22d and 29th March, and the 5th and 12th of April, Miss Martineau or her friends have published letters attempting to set aside the truth of the statements. But nothing contained in these letters has invalidated the accuracy and correctness of the facts collected by Dr Brown; and it may be justly said, that with all this in view, they have tended only to corroborate and confirm the whole matter; and to show that, while J. Arrowsmith had obtained in the usual manner the knowledge of the facts, which she pretended to acquire by phaneropism in the magnetic state, there is no doubt that she is partly deceived, and partly she is a hypocrite and impostor. It is on this account quite unnecessary to notice the subsequent letters to which this controversy has given rise; and we must refer our readers to the pages of the Athenæum already mentioned. We repeat what we formerly asserted, that while the pretended phaneropism of J. Arrowsmith is shown to be complete delusion, the same will be the result of every other instance in which individuals lay claim to the possession of the same powers.

III. The author enters next on the subject of prevision or foresight, the faculty of foreseeing and predicting events that are subsequently to take place. And here it is important to remark, that the magnetists seem to take for granted the reverse of what has been always taught and believed regarding the human mind. What is supposed to be more certain, or what is more frequently repeated than the aphorism, that the future is concealed from our view; that we know not what is to happen to us in the future period of life; that we cannot predict the result of the most trivial event or set of circumstances that may happen; that we cannot tell the time or the manner of our death; and that we can, by no effort of any faculty of the soul, penetrate a single day or hour into that dark and invisible region known by the name of the future. Nay, moralists and divines have gone further than this; and they have exhorted us to believe that it is a proof of Divine wisdom,—of the wisdom and benevolence of the Creator, that the future is, it is said, wisely and kindly hidden from our view. They have further said it is impertinent, presumptuous, and sinful to pry into futurity, or even to be very solicitous about it. So firmly is this principle of the constitution of the human mind believed to be established, that it has been invariably taught that in those very rare cases in which a dull and imperfect glimpse of the future has been revealed to particular individuals, that has been only by the special and direct interposition of Almighty power only for very great and important purposes, and that every deviation of this kind must be regarded as a suspension of the ordinary laws by which God Almighty governs the affairs of this world in general, and of mankind in particular,—in short, a miraculous revelation.

Such is the character of all those prophecies, the truth of which is most certainly established. Such are the conditions and circumstances in which the persons chosen for the channel of these prophecies have been placed. Either a particular event is revealed to one individual for a certain purpose, as the occurrence of the flood was to Noah; or to certain individuals are given obscure glimpses and general views of what is to take place after several centuries, as happened to the inspired prophets of Judea; or the individual possesses a general faculty of foreseeing future events and their connection,—a faculty of extreme rarity, and probably possessed by no one of mere apparently human faculties except Jesus Christ.

What then is to be thought of magnetists and mesmerists, who tell us at once that the human mind does, in certain circumstances, possess this power of foreseeing and foretelling future events? What becomes of the value of prophecy as a proof of Divine power, of Divine interposition, and of the truth of revealed religion? Are we to infer that the absurd fancies and visions of a hysterical girl, or the reveries of a dreaming madman, or the maudlin effusions of a superstitious moping idiot, are to be placed in the same rank with the predictions of the inspired prophets, or the revelations of Divine wisdom? To this conclusion, however, we must come, if the representations of the magnetists on prevision be founded on truth. In short, unless they are gross delusions and perfect deceptions, it is difficult to see how this inference can be avoided.

To illustrate this faculty of prevision, Mr Newnham gives the particulars of the case of Cazot, an epileptic nervous Frenchman, who makes several predictions regarding the periods of his epileptic seizures, of his being attacked with madness, a very natural result, and various other casualties, yet has not a sufficient amount of this foreseeing faculty to know, that in an attempt to stop a runaway horse, he was to be thrown down against the wheel of a carriage and receive an injury of the skull, that was to prove fatal.

He then details, from the posthumous works of La Harpe, a scene in which M. Cazotte the poet is the prophet, and which relates to matters of a very serious character. We know not whether this is to be regarded as a case of magnetic or natural prevision; we imagine the latter, but the author scarcely specifies. As it is, however, it is best to give it in the words of the authority whence it is taken.

> "It appears but as yesterday, and yet, nevertheless, it was at the beginning of the year 1788. We were dining with one of our brethren at the Academy,—a man of considerable wealth and genius. The company was numerous, and diversified:—courtiers, lawyers, academicians, &c.; and, according to custom, there had been a magnificent dinner. At dessert, the wines of Malvoisin and

Constantia added to the gaiety of the guests, that sort of liberty which is sometimes forgetful of bon ton:—we had arrived in the world, just at that time, when any thing was permitted that would raise a laugh. Chamfort had read to us some of his impious and libertine tales, and even the great ladies had listened without having recourse to their fans. From this arose a deluge of jests against religion. One quoted a tirade from the *Pucelle;* another recalled the philosophic lines of Diderot,

> " 'Et des boyaux du dernier prêtre,
> " Serrez le cou du dernier roi,'

for the sake of applauding them. A third rose, and holding his glass in his hand, exclaimed, '*Yes, Gentlemen, I am as sure that there is no God, as I am sure that Homer is a fool;*—and, in truth, he was as sure of the one as of the other. The conversation became more serious; much admiration was expressed on the revolution, which Voltaire had effected, and it was agreed, that it was his first claim to the reputation he enjoyed;—he had given the prevailing tone to his age, and had been read in the antechamber, as well as in the drawing room. One of the guests told us, while bursting with laughter, that his hairdresser, while powdering his hair, had said to him,—'*Do you observe, sir, that although I am but a poor miserable barber, I have no more religion than any other.*' We concluded that the revolution must soon be consummated,—that it was indispensable that superstition and fanaticism should give place to philosophy, and we began to calculate the probability of the period when this should be, and which of the present company should live to see the *reign of reason.* The oldest complained, that they could scarcely flatter themselves with the hope; the younger rejoiced, that they might entertain this very probable expectation;—and they congratulated the Academy especially for having prepared this *great work,* and for having been the great rallying point, the centre, and the prime mover of the liberty of thought.

"One only of the guests had not taken part in all the joyousness of this conversation, and had even gently, and cheerfully checked our splendid enthusiasm. This was Cazotte, an amiable and original man, but unhappily infatuated with the reveries of the illuminati. He spoke, and with the most serious tone. 'Gentlemen,' said he, 'be satisfied; you will all see this great and sublime revolution, which you so much desire. You know that I am a little inclined to prophesy: I repeat you will see it.' He was answered by the common rejoinder, '*One need not be a conjuror to see that.*' Be it so; but perhaps one must be a little more than conjuror, for what remains for me to tell you. Do you know what will be the consequence of this revolution,—what will be the consequence to all of you, and what will be the immediate result,—the well-established effect,—the thoroughly recognised consequence to all of you who are here present? 'Ah!' said Condorcet, with his insolent, and half-suppressed smile, 'let us hear,—a philosopher is not sorry to encounter a prophet.' 'You, Monsieur de Condorcet, you will yield up your last breath on the floor of a dungeon;—you will die from poison, which you will have taken, in order to escape from execution,—

from poison which *the happiness* of that time will oblige you to carry about your person.'

"At first astonishment was most marked; but it was soon recollected that the good Cazotte is liable to dreaming, though apparently wide awake, and a hearty laugh is the consequence. 'Monsieur Cazotte, the relation which you give us is not so agreeable as your Diable Amoureux,'—(a novel of Cazotte's.)

"'But what diable has put into your head this prison, and this poison, and these executioners? What can all these have in common with philosophy and the reign of reason?' 'This is exactly what I say to you; it is in the name of philosophy,—of humanity,—of liberty;—it is under the reign of reason, that it will happen to you thus to end your career;—and it will indeed be *the reign of reason;* for then she will have her temples, and indeed, at that time, there will be no other temples in France than the temples of reason.' 'By my truth,' said Chamfort, with a sarcastic smile, '*you* will not be one of the priests of those temples.' 'I do not hope it; but you, Monsieur de Chamfort, who will be one, and most worthy to be so, you will open your veins with twenty-two cuts of a razor, and yet you will not die till some months afterwards.' They looked at each other, and laughed again. 'You, Monsieur Vicq d'Azyr, you will not open your own veins, but you will cause yourself to be bled six times in one day, during a paroxysm of the gout, in order to make more sure of your end, and you will die in the night. You, Monsieur de Nicolai, you will die upon the scaffold;—you, M. Bailly, on the scaffold;—you, Monsieur de Malesherbes, on the scaffold.'—'Ah! God be thanked,' exclaimed Roucher, 'it seems that Monsieur has no eye but for the *Academy;*—of it he has just made a terrible execution, and I, thank heaven . . . . .' 'You! you also, will die upon the scaffold.' 'Oh, what an admirable guesser,' was uttered on all sides; 'he has sworn to exterminate us all.' 'No, it is not I who have sworn it.'—'But shall we then be conquered by the Turks or the Tartars? Yet again . . .' 'Not at all, I have already told you, you will then be governed only by philosophy,—only by reason. They who will thus treat you will be all philosophers,—will always have upon their lips the self-same phrases, which you have been putting forth for the last hour,—will repeat all your maxims,—and will quote, as you have done, the verses of Diderot, and from La Pucelle.' They then whispered among themselves;—'You see that he is gone mad;'—for he preserved all this time the most serious and solemn manner. 'Do you not see that he is joking, and you know that, in the character of his jokes, there is always much of the marvellous.' 'Yes,' replied Chamfort, 'but his marvellousness is not cheerful;—it savours too much of the gibbet;—and when will all this happen?' 'Six years will not pass over, before all that I have said to you shall be accomplished.'

"'Here are some astonishing miracles, (and this time it was I myself who spoke,) but you have not included me in your list.' 'But you will be there, as an equally extraordinary miracle; you will then be a Christian.'

"Vehement exclamations on all sides. 'Ah,' replied Chamfort, 'I am comforted; if *we* shall perish only when La Harpe shall be a Christian, we are immortal.'

"'As for that,' then observed Madame la Duchess de Grammont, 'we women, we are happy to be counted for nothing in these revolutions:—when I say for nothing, it is not that we do not always mix ourselves up with them a little, but it is a received maxim, that they take no notice of us, and of our sex.' 'Your sex, ladies, will not protect you this time; and you had far better meddle with nothing, for you will be treated entirely as men, without any difference whatever.' 'But what, then, are you really telling us of, Monsieur Cazotte?—You are preaching to us the end of the world.'—'I know nothing on this subject:—but what I do know is, that you, Madame la Duchesse, will be conducted to the scaffold, you and many other ladies with you, in the cart of the executioner, and with your hands tied behind your backs.' 'Ah! I hope that in that case I shall at least have a carriage hung in black.' 'No, madame, higher ladies than yourself will go *like you* in the common car, with their hands tied behind them.' 'Higher ladies! what! princesses of the blood?' 'Still more exalted personages.' —Here a sensible emotion pervaded the whole company, and the countenance of the host was dark and lowering:—they began to feel that the joke was become too serious. Madame de Grammont, in order to dissipate the cloud, took no notice of the reply, and contented herself with saying in a careless tone:—'*You see that he will not leave me even a confessor.*' 'No, madame, you will not have one, neither you, nor any one besides. The last victim to whom this favour will be afforded will be . . . . .' He stopped for a moment. 'Well! who then will be the happy mortal to whom this prerogative will be given?' ''Tis the only one which he will have then retained—and that will be the king of France.'

"The master of the house rose hastily, and every one with him. He walked up to M. Cazotte, and addressed him with a tone of deep emotion: 'My dear Monsieur Cazotte, this mournful joke has lasted long enough. You carry it too far,—even so far as to derogate from the society in which you are, and from your own character.' Cazotte answered not a word and was preparing to leave, when Madame de Grammont, who always sought to dissipate serious thought, and to restore the lost gaiety of the company, approached him, saying, 'Monsieur the prophet, who has foretold us of our good fortune, you have told us nothing of your own.' He remained silent for some time, with downcast eyes.' 'Madame, have you ever read the siege of Jerusalem in Josephus?'—'Yes! who has not read that! But answer as if I had never read it.' 'Well then, madame, during the siege, a man for seven days in succession went round the ramparts of the city, in sight of the besiegers and besieged, crying unceasingly, with an ominous and thundering voice, *Woe to Jerusalem*, and the seventh time he cried, *Woe to Jerusalem, woe to myself*—and at that time an enormous stone, projected from one of the machines of the besieging army, struck him, and destroyed him.'

"And after this reply, M. Cazotte made his bow and retired.

"When, for the first time, I read this astonishing prediction, I thought that it was only a fiction of La Harpe's, and that that celebrated critic wished to depict the astonishment which would have seized persons distinguished for their rank, their talent, and their fortune, if, several years before the revolution, one could have brought before them the causes which were preparing, and the frightful consequences which would follow. The inquiries which I have since made, and the information I have gained, have induced me to change my opinion. M. le Comte A. de Montesquieu having assured me, that Madame de Genlis had repeatedly told him, that she had often heard this prediction related by M. de La Harpe, I begged of him to have the goodness to solicit from that lady more ample details. This is her reply:

"'November 1825.

"'I think I have somewhere placed among my *souvenirs* the anecdote of M. Cazotte, but I am not sure. I have heard it related a hundred times by M. de La Harpe, before the revolution, and always in the same form as I have met with it in print, and as he himself has caused it to be printed. This is all that I can say, or certify, or authenticate by my signature.

"'COMTESSE DE GENLIS.

"'I have also seen the son of M. Cazotte, who assured me that his father was gifted, in a most remarkable manner, with a faculty of prévision, of which he had numberless proofs; one of the most remarkable of which was, that, on returning home on the day on which his daughter had succeeded in delivering him from the hands of the wretches who were conducting him to the scaffold, instead of partaking the joy of his surrounding family, he declared that in three days he should be again arrested, and that he should then undergo his fate:—and in truth he perished on the 25th of Septembrr 1792, at the age of 72.'

"In reference to the above narrative, M. Cazotte, jun. would not undertake to affirm that the relation of La Harpe was exact in all its *expressions*, but had not the smallest doubt as to the reality of the *facts*.

"I ought to add, that a friend of Vicq d'Azyr, an inhabitant of Reimes, told me, that that celebrated physician, having travelled into Brittany some years before the revolution, had related to him, before his family, the prophecy of Cazotte. It seemed that, notwithstanding his scepticism, Vicq d'Azyr was uneasy about this prediction.

"Letter on this subject addressed to M. Mialle by M. le Baron Delamothe Langon.

"'You inquire of me, my dear friend, what I know concerning the famous prediction of Cazotte mentioned by La Harpe. I have only, on this subject, to assure you, *upon* my honour, that I have heard Madame la Comptesse de Beauharnais many times assert that she was present at this very singular historical fact. She related it always in the same way, and with the accent of truth:—her evidence fully corroborated that of La Harpe. She spoke thus, before all the persons of the society in which she moved, many of whom still live, and could equally attest this assertion.

"'You may make what use you please of this communication.

"'Adieu, my good old friend.' I remain with inviolable attachment, yours,

"'Baron Delamothe Langon.

"'*Paris, Dec.* 18*th*, 1833.'"

It appears that in several circumstances this piece of prophetical annunciation was verified. Condorcet was apprehended at some distance from Paris and thrown into a dungeon. Next day he was found dead. Bailly and Malesherbes died on the scaffold, as did also the Duchess de Grammont and Cazotte himself. Vicq d'Azyr died of inflammation of the lungs.

There is no doubt that this narrative, taking place at the time at which, and under the circumstances under which it occurred, is extraordinary in several respects. Yet, if we carefully consider all the circumstances, it will appear not only less extraordinary than it appears, but it may be regarded as by no means unnatural. The fact took place, it is said, in the beginning of 1788, when, though the Revolution had not openly and actually broken out, its seeds had been for several years most extensively sown through every division of society, and were growing actively, and producing vigorously their legitimate fruits. In November 1787, at a full meeting of the Parliament of Paris, attended by all the princes of the blood and the peers of France, Louis the Sixteenth had made that memorable speech, in which he proposed for their approbation the demand of 450 millions of francs, = L.19,000,000 Sterling, connected with a request that the Protestants should be established in all their ancient civil rights and privileges. As the debate which followed contained various unwonted freedoms, his Majesty suddenly rose and ordered the edict to be registered without further delay. This proceeding caused the House, on the motion of the Duke of Orleans, to protest against the whole proceedings as an infraction of the rights of Parliament, and therefore null and void; and the result was, that as the King attempted to punish, in various modes, the persons most prominent in this movement, the Parliament, irritated at the invasion of their privileges, declared the proceedings of the day null and void. Though this might be regarded as the first instance of that collision between the King and Parliament, which ended in successive demands by the latter and concessions by the former, and the eventual subversion of the monarchy, yet it is impossible to doubt that such was the state of society, that persons of observation and reflection, who looked forward before the actual time, must have imagined, if they did not positively believe, that some great catastrophe was approaching. What between the oppressive and lawless tyranny of the government, the misery, destitution, and discontent of the people, and the corruption and profligacy of the higher classes, it was manifest that matters could not continue long in the position in which they then stood. Consider also what is exhibited at this very dinner party, where were met professed deists, infidels, scoffers at religion and morality, and all sorts of unprincipled persons. Is it astonishing that one person, who thought a little more seriously on the state of society than the others, should have been led to believe that some great and calamitous changes were at hand ? The memoirs of the day, which have been since published, show that many persons, alarmed at the aspect of affairs, the depression of property, and the evident diffusion of immoral and irreligious principles among all the upper and middle ranks, began even at that time to entertain the most dreadful apprehensions as to the final termination of the mighty political and social evils under which France was then groaning. It was evident that matters could not continue long as they stood. It was not less evident that some mighty explosion was approaching, and it was in short a mere question of time as to its occurrence. The exact nature of the change it might be difficult to divine. But one thing is certain, one result is confirmed by all experience, that where the minds of people brood long and apprehensively over present evils and their probable catastrophe, it does happen that the mind becomes filled with the most gloomy and dreadful images, and at length that which has been regarded as, in the course of events, merely probable or possible, becomes a matter of certain and confident conviction.

It is well known that similar states of the minds of men, and similar attempts at prophecy and prediction were not at all uncommon among the persecuted inhabitants of Scotland in the lamentable period between 1668 and 1682. Among these men, the mixture of stern enthusiasm for what they conceived to be pure and undefiled religion, the relentless hatred of, and unyielding resistance to, every thing prelatical, Episcopalian, or that had the appearance of Popery ; the consciousness of suffering the most excruciating tortures, every kind of privation and distress, and even death itself, for upholding what was accounted the truth, rather than consent to the practice of idolatrous worship, or a corrupt form of religion, united, probably, with no very kind wishes to their oppressors, gave their minds and thoughts a gloomy melancholy cast, made them often predict to these men disgrace, calamity, overthrow, and strange kinds of death ; and, in some instances, the predictions were verified.

These men read assiduously the prophetical books of the sacred volume, and especially the prophecies of Isaiah and Jeremiah ; and while they compared the state of Scotland to that of Judea and Jerusalem, they sought to apply the language and denunciations of the prophecies to themselves or their persecutors, and they at length believed themselves inspired with a similar spirit of prophecy to that which guided the great seers of Israel and Samaria. In their solitary wanderings on the hills and moors of Scotland, and in dens and caverns of the rock, between prayer, meditation, and fasting, they worked themselves to such a pitch of enthusiasm, that they imagined they beheld in vision the future fate of their country and its oppressors, and often, in their excited exhortations to each other, they broke forth in frightful delineations of the evils which, in heaven's own time, were to overtake and destroy these men.

These verifications, when they really did ensue, we confidently believe, not to have been the result of any internal prophetic foresight, but the natural consequences of that miserable state of society which then prevailed, and in which it required no great amount of the prophetic spirit to foresee that calamities, and violent or unusual kinds of death might befal the leaders in these scenes of tyranny, persecution, and bloodshed. In a few instances, they may have been the effect of mere coincidence, and in a few the prediction might be regarded in the light of a threat to be carried into execution, if time, place, and power concurred. The prophecies of Alexander Peden, among other instances, are well known and much read among the west country Presbyterians, and Cameronians, and Scottish Covenanters, and in their truth the common people in Scotland still firmly believe.

There appears, therefore, nothing very extraordinary or unwonted in the prophetic denunciations of M. Cazotte so far even as they were fulfilled. They contain mostly general statements and representations regarding what might ensue, considering the state of society at that time, and these denunciations are too general in their character to justify the inference that they were more than judging of the future from the past. But, under all circumstances, they cannot be justly quoted as proofs, or even illustrations of the prophetic spirit in the magnetic state.

We cannot, indeed, look on such attempts at prophecy in any other light than the visions and dreams of an excited brain; the wild and thickcoming fancies of a mind where reason and intellect have been partially and temporarily subverted, and where the observation of present and passing events, and the anticipation of the future are equally withdrawn from the dominion of common sense.

IV. We have no doubt that every sensible person will agree with us in thinking that animal magnetism, or human magnetism, or by whatever other name it delights to be called, is a rare piece of folly and delusion. There is, however, yet another pretended science, which is a piece of folly and delusion quite as perfect. This is phrenology. As if it were not enough for these two products of human foolishness to flourish singly and apart, an attempt has been made to unite them; and thence has sprung that unrivalled hybrid production, called phreno-magnetism. As, according to the hypothesis of phrenology, the brain contains or consists of a great number of distinct organs, each destined to be the seat of particular moral feelings and separate mental operations, so in this mixed hypothesis of phreno-magnetism, it is conceived that it is possible to magnetise particular cerebral organs, to call forth the evidence of the operation of particular moral qualities, or to excite the action of certain intellectual faculties.

The mode of practising phreno-magnetism is abundantly simple. It consists of two processes. First, the individual is magnetised, or, by means of the usual passes, thrown into the state of magnetic sleep. Then the region of the organ which is wished to be excited or thrown into action is touched, *secundum artem*, by the operator; and forthwith the individual gives the external indications of the organ being excited. If he be pugnacious and quarrelsome, he strikes from him every one near him. If he be endowed with the musical faculty, he sings, whistles, or hums or plays a tune.

This is in truth a very pretty toy, one of the most recent and infantine of the magnetic school, remarkably well adapted to the tender and infantine state of that science. To this doctrine Mr Newnham is rather opposed; and, however inclined to swallow one absurdity, he evinces a very decided resistance against the reception of two united. This is not at all wonderful. A man gets familiar with the hideous and grotesque features of one idol, and may be led, from some peculiarity of intellect, to think it a divinity, or at least the representation of a divinity; but it becomes a more difficult matter to unite two such idols into one, and convert the whole into a rational object of worship. We say nothing to the gross materialism which is implied in phrenology, and which, though disclaimed by various professors of that science, is honestly and candidly avowed by others. To this we say nothing,—because the doctrine of materialism, so far as it is intelligible, has been refuted again and again; and all the statements made by the present advocates of that hypothesis, that all the mental faculties and moral qualities owe their peculiarities to the organization of the brain, can never be received in any other light than as the inductions of minds, which have never attended to anything but material objects, and the laws by which their actions are regulated. On this ground, however, Mr Newnham criticises and condemns phrenology, and above all phreno-magnetism. This he does very much upon the usual grounds of the injurious effect of all theories of materialism upon morals and religion, showing that the moment materialism is admitted, man can no longer be regarded as an accountable and responsible moral agent.

To this mode of reasoning it is unnecessary to urge any objections. It has the advantage of being intelligible by the majority of readers; and though the *deductio ad absurdum* be not always so perfect and beautiful an argument as that which is founded on the nature and origin of the hypothesis, yet it is by no means to be despised. It is true that in the application of this argument, Mr Newnham is rather severe to the phreno-magnetists; for he hesitates not to classify them, at least those who avow materialism, and it is not easy to see which of them do not, with those persons who are altogether the slaves of their organization, in short with madmen. (P. 386.)

We deem it unnecessary to recapitulate the arguments, by means of which Mr Newnham has undertaken to destroy this hypothesis. They are not new; but they are moderately well put forward; and if evidence were required to destroy any doctrine so absurd and so groundless, this evidence will be sufficient. But the truth is, that the task is quite superfluous. To those who are already convinced of the weakness of phrenology and its elder sister materialism, the present argumentation will be altogether unnecessary. Those who are attached to materialism and phrenology, on the other hand, this argumentation will be quite inadequate to convert from their errors, in so far as their minds are not made of convertible matter, neither do they desire to resign these palatable and pliant doctrines.

Amidst this discussion, it must appear wonderful that Mr Newnham, who is sufficiently quick-sighted as to the shallowness of the claims of phrenology on the attention of the philosophic world, has not his mental vision equally clear as to those of magnetism. Does magnetism rest on a more solid foundation than phrenology? Is it in its pretended phenomena more certain or conclusive in its results and practical applications? Is it less equivocal or ambiguous in its characters? Are either of them any thing but the fanciful offspring of the minds of their advocates and champions? and will the time not come when the mind will awaken from this miserable delusion? We confidently believe that this time will come; and though at present both hypotheses appear to obtain a temporary protection from a few good-natured and not very strong-minded individuals, both will prove to be complete delusions deserving the attention only of the most ignorant, the most weak, and the most credulous of mankind.

V. The last subject treated by Mr Newnham is that of *ecstasis* or ecstasy. This, with the love of French terms so predominant in the present day, he tells us, must be called *extase*, because the term ecstasy is quite inadequate to represent what is meant by this state. This we confess is to us totally unintelligible. Why the English translation of a Greek word should not be quite as expressive, both in comprehensiveness and in precision, as the French translation of the same term, we cannot perceive. If *ex-*

*tase* has been recently applied by the magnetists to express a peculiar state of the human body, it was not so applied originally; and why the English ecstasy, which is equally good as the French term, should not, with its other significations, be employed to designate the same condition, we are equally incapable of perceiving. Let us see, nevertheless, whether the definition of the state of ecstasy given by the author furnishes any argument or reason for such a proceeding.

"This state, which involves an incomprehensible degree of intuitive contemplation, as well as an augmented capacity and exaltation of the faculties, has been employed as the stock upon which enthusiasm and folly on the one hand, and designing chicanery on the other, have grafted much which is absurd and untenable. Thus for instance, it has been attempted to prove by it the identity with itself of sorcery and demonology; it has been attempted to show that through its influence flowers and shrubs will decay and flourish at the will of the individual;—and that the weather may be so influenced as that it may rain at one point, and not rain at another,—and that these peculiarities shall be under the influence of the will of the magnetiser. Now all these and many such like follies are utterly repudiated:—they are excrescences which are maintaining a parasitic existence upon the foster-parent plant, but which have no legitimate connection with the original stock.

"Again it has been asserted that sometimes somnambulism lapses into a state of mystical extase, in which the soul retiring within itself is admitted to the contemplation of the Eternal, exults in its glory, converses with the angels, and delights in the unspeakable accents of the seraphim. Here again is such an amount of exaggeration of the truth, that it has almost lost its original semblance; and it has become so mixed up with error, that it should remain as an example of how far honest intention may be perverted and become amalgamated with untruth and dishonesty.

"But leaving these perversions, let us simply state what we mean by this absolute condition from which every tinge of hyper-exaltation and enthusiasm has vanished;—a peculiar state which it is necessary to inquire into, and that more particularly, because it has been mistaken and misrepresented.

"In this extraordinary state," continues Mr Newnham, "the supremacy and pre-eminence of religious ideas is mainly remarkable; the mind seems to be abstracted from the low and grovelling relations of humanity and to expand in a heavenly atmosphere; hence the absurdities and perversions to which we have above alluded. In truth, the devotion of man's present to his future state, and the agency of a superintending Providence in all that concerns him, are strongly marked in the thoughts and feelings:—life appears only as a voyage of preparation for eternity, during which will be fixed the future position there of the individual:—the earth and all attaching to it has, in consequence of his distance from it in spirit, dwindled into a mere speck; every connection with it appears dissolved, and the whole system seems spiritualized. In this state the independence and immortality of the soul, and the liberty of man as a free agent, appear self-evident; and the extatique is convinced that God regards him, and that prayer is the communication between him and his creatures; the only means of obtaining his aid, of averting menacing evils, and of converting apparent misfortunes unto blessings."

In some sense this is not a just view of the state called ecstasy. It is manifest that a person may, and if he be really a religious person must, without, however, being in the state called ecstacy, and being indeed in the full possession of his sober senses, believe that God regards him; that prayer is the communication between him and his creatures; the only means of obtaining his aid, of averting menacing evils, and of converting apparent misfortunes into blessings. These opinions were held even by philosophical writers who were neither ecstatics nor fanatics. They were held by Socrates, Plato, Cicero, and Seneca; and they are maintained by all rational Christians; in modern times by Hooker, Tillotson, Wollaston, Paley, Hannah More, and many others not to be suspected of fanaticism.

It is probable that Mr Newnham perceived this, for he next adds, that individuals in this state may actually fancy themselves inspired, and their words dictated by an interior voice; and so fall into error and delusion. There is, indeed, a fundamental error at the commencement of the definition in representing the supremacy and predominance of religious ideas to be remarkable, that is, we suppose, characteristic. Now, it appears to us that this is not the true and just representation of the state. Ecstasy may take place without one single religious idea. It is merely that state in which the individual is, as it were, out of himself, *quod qui hanc patitur, extra seipsum quodammodo constitutus est.* The person is in short no longer in his perfect senses. The mind, or thinking principle, is engrossed and absorbed with something of its own; and consequently ceases to take cognisance either of the situation of its possessor, or of the surrounding objects. The term *ecstasy*, accordingly, may serve to denote this condition quite as well as, nay much better than, the French term *extase*, which is in no way more expressive or better suited for the purpose intended.

As a mere corporeal state dependent on the nervous system, *Ecstasis* has been defined more or less fully and accurately by Sauvages, Joseph Frank, and other writers, nosological or practical. Sauvages defines it as differing from catalepsy by the patient retaining the position which he had at the commencement of the attack, and being void of all sense or motion of the limbs, and from *Catochus*, because it arises from intense contemplation or attention, or a severe moral affection.* Joseph Frank informs his readers that ecstasy consists in intense thought or contemplation, the individual remaining motionless on the spot, the internal senses being abolished, without the state of sleep,—with gesture, speech and singing indicating the divine visions of angels, or of—demons. How great the difference! How striking the contrast! This state he afterwards illustrates by referring to various cases, especially in females, who are most prone to this sort of elevation of mind; and to the condition produced by inhaling nitrous gas, and cites as proof the description which Sir Humphry gives of his sensations after inhaling this substance.†

On this subject it is unnecessary surely further to dwell. Ecstasy is evidently closely allied to the magnetic state, if not sometimes identical with it, and it is equally unfit for the exercise either of correct observation, calm reflexion, or sound judgment.

What the author means to prove by this chapter it is not easy to understand. The main conclusion which to us appears to result from it is, that the human mind is liable to most deplorable and dangerous errors and weaknesses. This, it may be answered, is nothing new, and might be learned without perusing a post octavo of four hundred odd pages. All true and undeniable. Still it is a benefit in its way to provide, for those who desire it, information adequate to show the truth or the falsehood of a fashionable hypothesis.

## ART. III.—*A Physiological Essay on the Thymus Gland.* By JOHN SIMON, F. R. S.; F. of the Royal College of Surgeons; Demonstrator of Anatomy in King's College, London; and Assistant Surgeon to the King's College Hospital. London, 1845. 4to. pp. 100.

THE thymus gland has been, with one or two other organs in the human body, a great enigma both anatomical and physiological; and though many attempts, both ingenious and bold, have been made to explain its difficulties, it seems doubtful whether the true Œdipus has yet appeared. These difficulties, indeed, have appeared so considerable that most of the recent inquirers have shown that they conceived, that the great object was to examine carefully and describe faithfully anatomical structure and peculiarities, and trusted that the elucidation of the true nature and uses of the body might at length be evolved from these investigations. Such appear to have been the notions entertained by Meckel, Laennec, Haugsted, and Cooper; and such also appears to be the opinion of the present author.

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* Nosologia Methodica, tom. i. p. 828. Amstel. 1768.

† Praxeos Medicæ Universæ Praecepta. Auctore Josepho Frank, Aug. Imp. et Totius Rossiæ Autocrat. a Consiliis, &c. Partis secundæ volumen secundum. Taurini, 1821, p. 66.

It cannot be forgotten by the profession that Sir Astley Cooper bequeathed a large sum of money to furnish a prize of L.300 to be given every third year, under certain conditions specified in his will, for the encouragement of original investigations in physiology and surgery.

To the present essay the appointed judges, the physicians and surgeons of Guy's hospital, made the first award of this prize nearly twelve months ago; and the performance, therefore, comes before the profession with all those high claims to attention, which may be expected to attend an essay so much honoured.

The first chapter is devoted to the literary history of the progress of anatomical research into the structure and uses of the thymus gland; and shows that the author has spared no pains in giving an accurate and useful account of the labours of his predecessors. In our thirty-eighth volume (p. 428) we gave a full account of the labours of Sir Astley Cooper himself on this ambiguous body, and we took at that time a view sufficiently minute of the services of preceding anatomists; and shortly after, in our forty-second volume, (p. 474,) we completed the anatomical and physiological history of the thymus gland, by a detailed sketch of the contents of the treatise of Dr Haugsted of Copenhagen; and since that time we have taken occasion to notice more or less fully the various services of different inquirers on the same subject.

This renders it quite unnecessary to recur to the consideration of this department of the subject, and we therefore proceed at once, without further preamble, to the peculiar researches of Mr Simon.

The earliest form in which Mr Simon recognised the thymus gland was that of elongated simple cylindrical tube, presenting several regular tortuosities. The contents of the tube are seen, by a magnifying power of 400 diameters, to be granular and dotted, but not hitherto showing distinct corpuscles. This is, in the foetus of the ox and sow, from half an inch to one inch and a half long.

At a period earlier, he believes that the first rudiments of the gland will be found in a series of primordial cells arranged in a line along the cervical vessels and pericardium. These primordial cells he further thinks form a simple series for each half of the body, and are arranged in a line which corresponds to the axis of the future gland, and nearly represents its length in proportion to the surrounding parts.

The second stage in the course of development presents an analogy with the mode of growth ascribed to glands. The tube bulges at certain points of its length on one side or the other, and gives origin to *diverticula*, or follicles, which continue their connection with its cavity. These follicles have the same structure as the primary tube, of which they are expansions; and their contents are the same.

These follicular expansions are only transitional forms, varying according to the stage of development. They form at this period segments of a circle varying in size, sometimes exactly hemispherical, but always tending to become pedunculated, and then maintaining their connection with the primordial tube by a narrow neck or isthmus.

The steps of development are not simultaneous in all parts of the gland. They advance most rapidly at certain points, viz. at those which ultimately attain the largest size. In the fœtal calf three centres of development are observed, one corresponding to the pericardium, one to the upper part of the windpipe, and one to the angle of the jaw. Modification is observed in the mode of development according to the expansive capacity of the regions. Thus, while in the cervical portion, where growth is not confined by the character of the surrounding parts, and may expand equally in all directions, the growth assumes a solid form;—in the pericardial portion of the organ, where its growth might impede the action or growth of the heart, it tends rather to superficial extension. This peculiarity is very distinct in the fœtal pig.

The third stage in the progressive development consists in the commencement of ramification in the follicles. This process usually begins when the follicle has attained the size of three-fourths of a sphere, or a little later, and takes place without elongation of the peduncle or neck connecting the follicle to the main canal; hence these secondary and tertiary extensions of the cavity do not possess the tubular structure in a form so complete as the axis from which they spring. The mode of ramification seems to be the following: one follicle is bulged or expanded into two; two into four or five; and hence may be formed six, seven, or eight follicular expansions, connected and communicating, hanging like a cluster of grapes, by the original peduncle, which connects them with the main canal.

It is either not easy to determine the number of these secondary or tertiary ramifications; or there is in the process nothing certain. Mr Simon seems to consider the dichotomous and quaternary as the most common; that is, one follicle is ramified into two; and what is precisely the same thing, two are expanded into four. But he represents the process as the same in all parts of the tube, and extending to all portions of the tube. And by the repetition of this process the gland progressively attains the size which it presents when examined. "There is," he says, "no change in the nature of the phenomena. The later steps are exact iterations of the first." The type of development he represents to consist essentially in the lateral growth of branching diverticula from a central tubular (cylindrical) axis; and as the extremities of these *diverticula* tend always to assume the vesicular shape, and to represent large segments of spheres, "the permanent structure of the gland, not less than its mode of development, may be termed *tubulo-vesicular.*"

In the account now given may be found the explanation of the discordant, and in some respects contradictory descriptions of the structure of this body by the most cautious and laborious anatomists. As development advances, the primary tube or cylinder, though at first the most essential part of the organ, and even enlarging along with the growth and ramification of the follicles, is at length so much inclosed and surrounded by these bodies, as no longer to present the same important part and size which at first it did, and in short becomes almost lost amidst this latter portion of the gland. Though hidden, however, and as it were obscured, it still exists, and may be demonstrated by suitable means.

It will be remembered that Putaeus and Haller showed by inflation this central cavity; and Sir Astley Cooper, by injections, demonstrated its existence, extent, and connection with the lateral lobes, or the cells and vesicles. But to several anatomists this evidence appeared liable to objection; and these were disposed to retain the old notions. Thus it was remembered that Roux and Buisson, the continuators of Bichat, had represented the thymus gland as an aggregation of independent vesicles or small bags.* This opinion has been accordingly revived and enforced, and illustrated by Berres and Bischoff; while Henle considers the true structure as undetermined.

In noticing at the same time the conclusions formed by Meckel on this discordance in the representations of anatomists, we took occasion to propose the question, " Is it not possible that the different states of the interior may be referable to different periods in the process of development."† This conjecture has been to a great extent verified by the present author, who, it must be allowed, by combining the different modes of mechanical investigation, with the use of the microscope in studying the early structure of the gland, has certainly made great progress in reconciling these discrepancies and in elucidating the true structure of the thymus. He shows that there is a central cavity communicating with numerous lateral vesicular follicles or sacs; and that though the former portion is indeed the primordial form, and the main, if not the sole part of the gland, yet as the body enlarges, the lateral vesicles increase in size and number so much, that they eventually constitute the great part of the gland.

The thymus gland enlarges considerably immediately after birth. But after some time the rate of this growth is retarded; and its further enlargement ceases about two years after birth. It then remains stationary for a variable number of years, assuming in ordinary circumstances the structure and aspect of fat.

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* Edinburgh Medical and Surgical Journal, vol. xxxviii. p. 431.

† Ibid. p. 432.

About puberty it appears to undergo a still more marked diminution in size, falling almost to a vestigiary or rudimentary form; but its atrophied lobes may often be detected years after over the pericardium. Remnants of the gland may be detected in subjects of from 20 to 25 years of age, and even at 30 and later.

The contents of the cavities of the thymus gland consist of a fluid in which are recognised an immense number of microscopical corpuscles floating, flat and circular, or orbicular, and varying in diameter from $\frac{1}{2350}$th of an inch to $\frac{1}{3750}$th of an inch. These corpuscles are marked by minute dottings. Mr Simon found cells in which these dotted corpuscles occupied the relation of *nuclei*. These cells are eventually converted into fat cells.

The analysis of Morin shows that the thymic fluid contains fibrin with phosphates, albumen, gluten, and extractive matter in water. An analysis given by the author indicates the presence of fibrin, gelatinous tissue and fat, a substance between albumen and casein, and phosphates of soda and lime, in water. These facts show that the secretion or content of the thymus gland is represented by protein, or that general principle which is convertible into fibrin, albumen, gelatine, or casein; in other words, the common nutrient matter of the system.

Mr Simon gives the most ample and correct account of the comparative anatomy of this gland extant; and from this he deduces the following general results. "1. *The presence of the gland* is co-extensive with pulmonary respiration. 2. Its *shape and position* are variable and unimportant. 3. Its *size and duration* are, generally speaking, in proportion to the habitual or periodical activity of the animal. 4. Where it remains as a persistent organ, it is usually but one of several means for the accumulation of nutritive material. Its continuance, under such circumstances, is generally accompanied, though in some instances superseded, by a peculiar accessory contrivance, the *fat body*."

The fifth chapter, on the Morphology of the Thymus gland, is elaborate, ingenious, and philosophical. The author takes a general comparative view of the minute microscopical structure of the cell-development in the true glands and in the false; and referring the thymus to the latter order, he represents the cytoblasts of which it consists, to be at first without cells, and afterwards, when they are fully developed, to become nuclei of the fat-cells which form within the limitary membrane. The secretion also round these cytoblasts, he allows equally as in the true glands; but represents it to take place within shut cavities, in other words, within cavities without excretory duct.

The Functions of the Thymus, he infers, may be stated to be, —by means of an apparatus strictly analogous to that of true glands, to secrete into a closed cavity certain particular elements of nutrition. In most animals this is a temporary arrangement; and the secreted matter then presents itself in a fluid form, and is related to the universal nutritious material, the *liquor sanguinis.* In some animals, however, the arrangement passes from the temporary to a permanent state; and the secretion then manifests itself in the solid or at least consistent form of fat. This difference tends to elucidate the general purposes of the gland in the economy. The fat of the animal kingdom, he argues, is similar to starch in the vegetable kingdom, secreted and stored in reservoirs to be applied to future purposes.

The author thence deduces the general conclusion, that the THYMUS GLAND FULFILS ITS USE AS A SINKING FUND OF NOURISHMENT IN THE SERVICE OF RESPIRATION. Adopting, in short, the hypothesis of Liebig, that life consists in a process of slow combustion (*Eremacausis*), he thinks that at certain times, and in certain circumstances, the tissues are wasted much and rapidly, in others very slowly and little, or as he styles it, infinitely little. The oxidable matter required for the oxidising influence of the atmosphere on the former occasions, can be provided in no other way than by the thymus gland and analogous organs during the latter periods of little or no consumption; and this duty, therefore, he thinks the thymus fulfils.

On the soundness of these speculative views we feel that it would be rash to offer any opinion. They will require to be subjected to the scrutiny of many observers, and several years' observation, before any decided conclusion on their merit can be safely formed. On the value, however, of the anatomical facts ascertained by Mr Simon, we think there can be only one opinion. He has investigated patiently, laboriously, and carefully, the minute structure of the thymus gland; and we think all who know any thing of the history of this part of anatomy, will admit that he has given the subject a much higher degree of precision, as well as of clearness, than it has yet possessed. This Monograph will remain for many years the best on the subject.

This work is illustrated with many beautiful engravings on wood, and is to all concerned a most creditable performance.

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## ART. IV.—*Practical Remarks on some Exhausting Diseases, particularly those incident to Women.* By Sir JAMES EYRE, M.D., Physician at the St George's and St James's Dispensary, &c. London, 1845. Pp. 75.

IT is always gratifying to see a treatise coming from the hands of a medical man much engaged in the practice of his profession, and having no greater pretensions than to make known a mode of treatment which he has found successful in various diseases. Such is the short treatise of Sir James Eyre, for, though styled Practical Remarks on some Exhausting Diseases, it is in reality on the therapeutic action of the oxide of silver in pyrosis, hæmoptysis, and menorrhagia. The oxide of silver, whose astringent and tonic powers were shown by M. Serre, Mr Lane, Dr Golding Bird, Dr Glendinning, Dr Ryan, and others, has been but very recently introduced into practice, and it was from their reports that Sir James Eyre was induced to give it a fair trial. The oxide of silver was given three times a day, in powder of gum tragacanth, in doses of from a quarter of a grain to one grain, according to the severity of the case, and was continued till relief was experienced. No bad effects seem to have resulted from the employment of this medicine, and it succeeded in giving relief when all other remedies failed. In no case was the oxide administered so long as any inflammatory symptoms were present, and care was taken to regulate the bowels by means of the compound pill of colocynth with extract of hyoscyamus, or by other gentle laxatives.

Ten instructive cases of pyrosis, out of many treated by the author, by means of the oxide of silver, are detailed. In these, after other remedies had failed, the oxide gave permanent relief after its continued administration for a month or so, and its occasional after employment if the complaint threatened a return. The cures in every case seemed to be permanent.

Eight cases of hæmoptysis are detailed in which the oxide succeeded in arresting the hæmorrhage without inducing any pernicious effects. Several of these cases afterwards terminated in confirmed phthisis; in others a temporary cure seemed to be effected. The last case related seems to have been a case of hæmatemesis, and the oxide answered equally well in it as in those of hæmoptysis, arresting the bleeding, and producing at all events a temporary cure.

The author evidently considers the arrestment of uterine hæmorrhage by this medicine as the most important of those detailed in his treatise. He narrates no fewer than 31 very instructive cases of menorrhagia, in which this medicine succeeded in arresting the flow, while it permitted the menstrual discharge to be secreted regularly and in natural quantity. It seemed to possess no power over the leucorrhœal discharge; but, in the cases detailed, injection of the solution of nitrate of silver checked this unnatural secretion. In one of the cases detailed, the uterine hæmorrhage depended on the presence of a polypus; even in this case, the oxide checked the bleeding. In two distressing cases, the hæmorrhage depended on cauliflower excrescence of the *os uteri*; yet even in these, the oxide of silver succeeded in checking the exhausting sanguineous flow. In remarking on one of these cases, the author begs to call the special attention of the profession to the employment of one grain doses of the extract of belladonna, as a suppository in cancerous diseases of the uterus, as originally recommended by Sir Benjamin Brodie. He states that it exceeds all other sedatives in the amount of relief which it affords in that most painful disease, and that by its means and that of the oxide of silver, much may be done to relieve the intense sufferings which attend the close of life in such persons.

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## Art. V.—*Researches and Observations on the Causes of Scrofulous Diseases.* By J. G. Lugol, Physician to the Hospital St Louis, &c. Translated from the French, *with an Introduction, and an Essay on the Treatment of the Principal Varieties of Scrofula*, by W. Harcourt Ranking, M. D. Cantab., Physician to the Suffolk General Hospital. 8vo. London. Pp. 306, and 42 of Introduction.

Scrofula, the cruels, *(les ecrouelles,)* or king's evil, whether we consider the numerous protean forms which it assumes, or the fact that in some form or other it affects nearly one-third of the human race, stands second in importance to no disease to which mankind is liable. It has consequently received no small share of attention in all ages, but more especially towards the close of the last, and during the present century. Since the beginning of the last century, indeed, our knowledge of the nature of scrofula, and of the very numerous shapes it assumes, has been steadily advancing, and many diseases which were at one time regarded as independent maladies, are now allowed to be connected with and dependent on a scrofulous habit of body. It is not long since chronic hydrocephalus was shown to be dependent on the same constitutional causes as scrofulous enlargement of the glands and rickets; and M. Lugol has added much new matter to this head, and demonstrated what was previously only suspected, that the chief cause of abortion in the pregnant female is the existence of a scrofulous constitution.

Till towards the close of last century, all the then recognised forms of scrofula were deemed contagious; but the experiments of Kortum, Goodlad, Hebreard, Le Pelletier, and others, who endeavoured to communicate the disease by rubbing in scrofulous matter and inserting it under the skin of the lower animals, and even of man himself, proved satisfactorily that the disease could not be so propagated. On the other hand, Pinel, Alibert, Richerand, and others, by carefully watching the effects of allowing scrofulous children to mingle with healthy ones, and finding that the malady was never so communicated, inferred that scrofula was not capable of being communicated by infection. It must be remembered, however, that the observations and experiments of these physicians were almost entirely confined to those cases in which there existed glandular swellings, with running sores, ulcers, &c. but were not intended to apply to that most fatal of scrofulous diseases—pulmonary consumption. In this country it has been the custom to conclude, that consumption is not capable of being communicated by infection or contagion; and the instances where two or three cases follow one another in one family or among the relations or attendants are referred, without farther inquiry, to the circumstance of their having been all exposed to a similar cause. M. Lugol, without mentioning consumption in particular, holds that no scrofulous disease whatever is contagious. Many continental physicians, but especially the Italians, hold, however, a different doctrine, aud regard consumption as a highly contagious disease. They narrate in proof of their views many cases where a healthy attendant, not in any way connected with the person, has fallen a victim to consumption from attending on one dying of that complaint.

M. Lugol, whose work we have now to notice, has been long the chief authority in France on scrofulous affections; and is well known in this country as the author of that interesting and instructive series of "Memoires sur l'emploi de l'Iode dans les maladies scrofuleuses," published from 1829 to 1831. In these he particularly stated his views of the treatment proper for scrofulous affections, deduced from a lengthened and extensive practice in private, as well as in the great Hospital of St Louis. Dr Ranking, the translator of the present edition, has not only done full justice to the work in this respect, but by his judicious and learned preface, and more especially by his "Essay on the Treatment of Scrofula," has greatly enhanced the value of this the English edition.

M. Lugol's work is divided into three parts: 1. On the hereditary transmissions of scrofulous diseases, and on the health of parents who beget scrofulous children; 2. On the pathological causes (so called) of scrofulous diseases; 3. On the external causes of scrofula. The author, moreover, in his preface promises us the completion of the subject in a separate work shortly to be published, in which he demonstrates that "tubercle is the anatomical character of this variety of the human family, and is the element which is associated with and gives the impress of an identical nature to all forms of scrofulous disease."

Scrofulous families are known by the general aspect of debility which pervades the children. There is a want of harmony in their external configuration; the limbs are either too long or too short, with large joints, and are awkwardly attached to the body; the median line is not in the centre of the body, and there is often observed a want of union in one or more points of that line, as the presence of hare-lip, fissured palate, &c. The chest is often keel-shaped, and the ribs variously distorted. Scrofulous families are generally of stunted stature or of unusual height. The mouth is either small and arched, or much too large, and the upper lip tumid; the first and second dentition is tardy, and the teeth ill coloured and friable. The spongy portions of the bones are too abundant in proportion to the solid tissue; a circumstance which renders the joints larger than usual, and causes the malar bone to be too prominent. The digestive organs are generally in a state of atony, and if this be the state of children, there is generally but small hopes of amendment, as the debility rapidly increases. Purgatives of rhubarb, jalap, and calomel, followed by iodine, are stated to be the best mode of relieving this state. Others have an unusual appetite, but the food does not nourish. This voracious appetite generally coincides with a pasty countenance, dull eye, fetid breath, and constant itching of the nose. During infancy, the physiognomy appears in advance of the age, but afterwards the person looks younger than he is. There is generally a great disinclination to movement, so that the child can only be induced to walk by being dragged along. Scrofulous children are subject to a spontaneous feeling of lassitude, and wake more tired than they go to bed. The pain of their ophthalmia is greatest in the morning, and they never can recover from it if kept in darkness. Exercise in the open air is essential in all scrofulous affections; even white swelling of the joints is most successfully treated by use of the limb in the open air. The genital organs of scrofulous subjects are more or less retarded in their development. In males it occasionally happens that even at the age of twenty, only one testicle has descended, or both are still in the abdomen. In females, again, signs of nubility are often wanting at eighteen years of age, and menstruation is not established till after two or three years of dysmenorrhœa, which sometimes lasts the whole of life. The menstrual discharge is either deficient or excessive. The generative function scarcely assumes its place among the vital functions, the voice remains infantile, and the characteristics of the sex are ill defined. Scrofulous persons are impatient both of bodily and mental fatigue. According to the phraseology of Lugol, "all the phases of their existence are abortive; they know neither puberty nor manhood; the difficulties which oppose themselves to their development are endless; they are beings physically and morally incomplete."

Many interesting observations are made on the scrofulous face of authors. M. Lugol remarks that it is an error to consider this cast of features as characteristic of scrofula, as it is more frequently absent than present, only occurring when the dermoid and cellular tissues of the face are involved in the disease; in fact, he has not met with it more frequently than in about one out of each hundred cases. A brilliant complexion, and habitual embonpoint are very commonly present in scrofulous subjects. The pupil is too large, there is slight epiphora, with styes on the eyelids, habitual coryza, and obstinate chilblains; the teeth are often white and closely packed, or they are black and decayed. The patient has a full neck, is subject to sore throat, the hair is thin and barely nourished; and the person is subject to headach and has usually a poor appetite.

Contrary to the statements of most authors M. Lugol remarks that more than the half of scrofulous patients have dark hair, and that the rest have it of various shades of auburn. It rarely affects those with light hair and complexion.

M. Lugol is very full on the hereditary transmission of scrofula, and strongly maintains that if one individual of any family has died of or is affected with any form of scrofulous disease, it will be found that the whole of that family have the same scrofulous tendency, and will sooner or later in life fall victims to some of its forms. He shows that it is no matter that one appears stronger than the rest; all he can hope for is to survive a little longer than the rest, he will infallibly transmit the scrofulous tendency to his offspring, and at length die himself of some form of scrofulous disease. This is a point which has been too much overlooked by all writers; for though hereditary transmission of the scrofulous tendency has been allowed by all, it has always been held that some of the family might, from particular circumstances, escape the tendency, and, keeping free of it themselves, generate healthy offspring. M. Lugol, indeed, from his extensive experience, affirms, "we can safely aver that we have never seen a scrofulous infant whose brothers and sisters were not also scrofulous; it would, indeed, be contrary to nature that the same parents should generate offspring with constitutions so widely different as are those of the healthy and scrofulous child." P. 21. And again. "Indeed the prevalence of the disease in the affected family appears to us to be a fact of so absolute a nature, that we do not hesitate to pronounce even the absent members to be scrofulous, from the observation of the existence of the predisposition in a single individual." P. 23. These results are brought more prominently forward, and illustrated by numerous cases, in the second section of this chapter, in which the author considers the mortality exhibited by scrofulous families, exemplifies the hereditary transmission of scrofula by describing the condition of families so affected; the condition of different families from a common stock, and the condition of children by different marriages. In this chapter also the fact afterwards more particularly noticed is alluded to, that repeated miscarriages are the manifestation of the scrofulous tendency in the highest degree, as it must be apparent that when a foetus dies of scrofula it is more deeply tainted than the child which dies at birth or at a longer or shorter period after it.

M. Lugol sums up this chapter in the following words,—

"Scrofula, then, is the most active element in the destruction of the human race; no other disease seizes upon victims so young or numerous; no disease so shortens the duration of life. Buffon has said that the nearer death approaches, the more his pace seems to be retarded; but this remark is true for those alone who enjoy a good original organization. Such only, in fact, grow old; old age is, therefore, in itself, an evidence of that healthy constitution which is permitted to endure to the utmost span of human existence."—P. 35.

The second chapter considers the health of parents who propagate scrofulous children. M. Lugol lays it down as an axiom, that there is the most intimate connection between the health of the parents and child; that the connection is so constant that it ought to be regarded as one of the fundamental laws of organization, and to which there is no exception. Accordingly, as our own health and that of our children make up the sum of our happiness, M. Lugol holds that "the greatest misfortune which can happen to man is to be born of unhealthy parents." In the different sections of this chapter, he demonstrates, by a reference to numerous cases, the truth of the above axiom, showing that scrofulous parents either lose all their children before birth by miscarriage, or soon after birth by various forms of scrofulous disease; not more than one in five living to be married. It is also pointed out that children born of consumptive parents are attacked by all the forms of scrofula; that, in fact, consumption is the most fatal of all the scrofulous diseases, and is essentially, as Sydenham termed it, "scrofula of the lungs." The next series of cases and observations demonstrate that parents who are in good health at the present time, may, if they have been scrofulous in their youth, generate scrofulous children. M. Lugol seems to suppose that a cure or the eradication of the disease is simply confined to the individual, and does not extend to his offspring. But the small number of cases which he adduces in proof of his view, and even the tenor of his remarks, renders it tolerably certain that the improved state of health of the parent is also communicated to the child, and that the subsequent occurrence of scrofulous disease in such a family is the exception and not the rule. Nay, we would go farther; and assert, from our own experience, that the occurrence of scrofula in such a family (viz. where both parents were apparently quite healthy, though one or both may, in infancy or childhood, have suffered from ophthalmia or some other mild form of scrofula,) owed its origin to some of those occasional causes which even M. Lugol himself allows will bring on such a state.

In conformity with what was above remarked, M. Lugol next proves that "parents who do not themselves appear to be scrofulous, but whose brothers and sisters are so; often generate scrofulous children." This too we can understand; though from our own observations we have ever regarded it as the exception not the rule, and this from frequently having been able to find another and an adequate cause.

The most important part of this chapter, however, is that treating of "the acquired health of parents who procreate scrofulous children." In this section M. Lugol endeavours to demonstrate that "a man originally sound in constitution may acquire certain states of ill health, the manifesttaion of which, in his offspring, will assume the form of scrofula, so that he becomes the root or starting point of a scrofulous family." In proof of this proposition it is shown, that those labouring under the venereal taint frequently beget scrofulous children; that the abuse of the sexual instinct has the same effect, as have also precocious marriages; for he holds it as a law of nature that man must have arrived at his full strength and development, before he is able to impart the elements of constitutional vigour to his offspring. Hence scrofula prevails pre-eminently among the highest as well as the lowest classes of society. Both in general, marry too early, but the highest class are previously debilitated by dissipation; the lowest by insufficiency of food and work disproportioned to their strength.

But not only are the offspring of those who marry prematurely liable to scrofula, M. Lugol shows that the offspring of aged parents are still more liable to that disease, and that this liability to the disease is rather increased when a marked difference exists between the ages of the parents, more especially if the female be the oldest. Thus M. Lugol has observed that that child which is born after the parents are about forty years of age, is frequently scrofulous when all those previously born are healthy, that the children of late marriages are frequently scrofulous, and more especially so when the female much exceeds the male in age. From his own observations the author concludes that a decay of the procreative faculty commences at the age of forty in the female and forty-five in the male, and it is from this circumstance that those who are born of parents above these ages are more sickly and delicate than others. A man who from any cause does not possess the comparative bodily powers of his sex, will engender scrofulous children; and lastly, parents who are paralytic, lunatic, epileptic, &c. equally generate scrofulous children.

The third chapter consists of general observations on particular states of health in parents, and goes over much of the same ground as the preceding chapter. In it M. Lugol endeavours to prove that scrofula does not in any case pass over a generation; and narrates cases to show that when minutely examined it will be found that those whom it is said to have passed have at some period of their lives manifested symptoms of some form of scrofula. It is also shown that the forced conscriptions in France during the last war tended much to the increase scrofula, as only the weak and infirm were left at home, or those who, to escape the conscription, had married before they had attained the age of nineteen years. The concluding part of this chapter details at great length the author's views on the marriage of scrofulous persons, and the health of scrofulous women after marriage. He paints in very vivid colours the distress of the married pair at the want of children, the frequent abortions to which the female is liable, the premature decease of child after child, and the early death of the mother leaving a delicate and helpless family soon to drop after her into a premature grave. The author therefore arrives at the conclusion, that some means ought to be used to prevent the marriage of scrofulous persons; in fact, he would make laws for stopping their marriage as binding as those for persons labouring under insanity itself.

We are far from thinking that any laws could ever be framed to prevent such persons from marrying. Let us remember that were such a law to be put in force, it would at once cut off one-third of the human race from forming the family tie. And what would be the consequence of such impolitic measures, but an increase of immorality to at least an equal extent. Let us remember that M. Lugol would not only prevent all from marrying who exhibit to every eye the ominous scars of scrofulous ulcerations, but all who in common language are termed delicate, or are in any way connected by blood with those who have died of a disease now recognised as one of the forms of scrofula. M. Lugol, however, apparently forgetting that his own researches prove that nearly as many fall victims to scrofulous disease, who did not inherit it by hereditary descent, as those who die from hereditary scrofula, imagines that, if the scrofulous were prevented from marrying, "society would then include fewer blind, fewer deaf and dumb, fewer rickety individuals, fewer cases of scrofula of every form; we should then have fewer orphans, incurables, and aged invalids; the population of almshouses, instead of increasing as they have done, would diminish; and there would be a better supply of vigorous and healthy men to cultivate the soil, and to multiply the products of industry." P. 105. We have great doubts as to this result being porduced even by M. Lugol's proposed interdiction of marriage, and there can arise no necessity, either politically or otherwise, for such an interdiction, seeing that even, according to his own account, one with the scrofulous taint, if he survive the period of puberty, may attain the age of from 45 to 65, or even survive longer. During this period he may usefully serve his day and generation; and if he then suffers family losses, he is only undergoing those trials, which man is destined to endure in this probationary state on earth. Allowing M. Lugol's theories true to the extent he asserts, viz. that a full third of mankind are scrofulous, recognised by features so distinct as to constitute them a distinct race of beings, it must be apparent to all, that within the course of a single generation every family would, by either parent, be connected with this scrofulous race; for it is a thing impossible to suppose that all the healthy should intermarry with each other, and not also with the more beautiful though scrofulous race. Besides, a considerable proportion of those who maintained themselves free from intermixture by marriage would, from the accidental causes which M. Lugol enumerates, become part of that proscribed race, would also become scrofulous.

The strong and unanswerable argument, however, against this doctrine, is furnished by M. Lugol himself, who, in another part of his work, shows that even those born highly scrofulous may, by proper hygienic treatment, escape altogether that disease, and that by judicious management the predisposition may be entirely got rid of even in these families. But independent of this mode of extinguishing the strumous diathesis, is it not certain that as the disease may be acquired under unfavourable circumstances, so under judicious management, it may be subdued and entirely extinguished? Do we not frequently see strumous diseases completely cured, and the disposition wholly extinguished, under the influence of free exposure to the air, exercise, living in the country, and the influence of other agents favourable to the improvement of health and strength? Why then interdict any from marrying? The same treatment which cured the parent will cure the child, and useful members of society will alone result even from the marriage of the highly scrofulous.

In an appendix to the hereditary causes of scrofula, is added some interesting remarks on the frequency of scrofula among foundlings and orphans, and on the transmission of scrofula by the milk of the nurse. The first has been long known; the latter, though often blamed as the cause, has never till now been demonstrated by a reference to distinct cases.

The second part of M. Lugol's work is "on the (so-called) Pathological Causes of Scrofulous Diseases;" and, as the subject is one which has never before been entered on by any writer, it is treated of under five sections.

Small-pox, measles, and hooping-cough have been frequently considered as causes of the production of scrofula; that, in fact, the chronic ophthalmia, or tubercular cervical glands, or abscesses, &c. were caused directly by the pre-existing disease. M. Lugol views matters differently. He considers that these diseases merely develope the scrofulous predisposition which the child has inherited from its parents; that, had it not been for this predisposition, these diseases would have been mild; but, in consequence of this scrofulous tendency, they are generally accompanied by some collateral phenomena which complicate the original ailment, render it more fatal, and as it declines developes the scrofulous affection. The author's views on these subjects are supported by the narration of many interesting cases of scrofula, which was traced to be hereditary, but latent, and was developed by each of these diseases.

It is shown that nervous fever, teething, intestinal worms, and other diseases of children attended with feverish symptoms, though sometimes accused of causing scrofula, merely act in developing the hereditary tendency, and he attributes the progress and often irremediable character of scrofulous diseases in children to the too common plan of treating them by depletion and antiphlogistic means. In so far, therefore, M. Lugol's views correspond with those lately so ably promulgated by Mr Hood.* Nursing is also a fruitful cause of the development of scrofula, and it acts in the very same way as the above-mentioned diseases, weakening the system still further, and allowing the hereditary predisposition to manifest itself.

Pregnancy and child-birth are next considered as causes of scrofulous disease, and the same facts are proved relative to them as of the above-named diseases. The hereditary predisposition to scrofula already existing in the constitution is simply developed, and not originally produced by these states. The most important fact, however, which M. Lugol brings forward under this head is, that abortion is the effect of the scrofulous habit of the body. He had previously shown, that any cause which weakened either parent tended to produce scrofula in their children. He here shows that spontaneous abortion may be referred to three causes. *1st,* To the defective health of the father; *2d,* To that of the mother; *3d,* To the defective health of both. Any circumstance, therefore, which debilitates the health of either parent, causes the embryo to be imperfectly developed, and of course to be aborted. He hence easily explains the circumstance, till now differently accounted for, of the great tendency to abort every fœtus, pregnancy after pregnancy. He shows that a false step, over-exertion, lifting weights, &c. have no effect in causing abortion with women of sound constitutions, but only with those who inherit the scrofulous tendency, or have been impregnated by men whose generative powers are weakened by this or some other cause.

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* Practical Observations on the Diseases most fatal to Children. London, 1845.

Not only does the scrofulous tendency produce spontaneous abortion, but it is a fruitful source of danger during delivery. The labour is often so severe as to endanger the lives of both mother and child, and render necessary the interference of art. The proximate cause of these difficulties lies in the debility of fibre; though the danger is often increased by hypertrophy or distortion of the bones of the pelvis, &c. Pregnancy and delivery are consequently frequently followed by the rapid development of the scrofulous tendency inherited from the parents; hence the rapid deaths often observed after delivery, caused by consumption, &c.

M. Lugol next shows the connection between erysipelas and scrofulous disease, pointing out the fact, that scrofulous disease often manifests itself for the first time after an attack of erysipelas, in other cases, that erysipelas arises once and again during the progress of a scrofulous affection. In these cases the erysipelas does not originate the scrofula, but merely causes the hereditary tendency to be developed. Several interesting cases are narrated of the occurrence of erysipelas with scrofula, and of scrofula first manifesting itself in the individual after an attack of erysipelas. The treatment which is recommended for erysipelas in a scrofulous subject is to give an emetic of the tartrate of antimony, and continue the same medicine in solution, largely diluted, for six or eight days. It is then replaced by seidlitz water and small doses of calomel twice or thrice a day. Barley water or thin broth is the only drink allowed. Sinapisms to the feet, and dry cupping or blistering the thighs, were also frequently employed. Iodine must not be administered during the erysipelatous attack, as it tends to increase the feverish symptoms.

No complication is more to be dreaded in the scrofulous subject than that of the venereal infection. With them it assumes characters of unusual severity, and renders antecedent scrofulous affections infinitely more dangerous. It is frequently observed, that, although the scrofulous temperament is marked, actual disease does not manifest itself till the person becomes affected with venereal disease. In other cases, pre-existing scrofulous disease, after remaining stationary for years, rapidly assumes a dangerous character after venereal affection. While in others the venereal disease causes the relapse of scrofulous affections. In all cases the reunion of the two diseases impart additional power to each, and together form a malady which neither exactly resembles syphilis nor scrofula. The analogy between the two diseases is so strong that M. Lugol says that with all his experience he has mistaken cases of secondary syphilis for scrofula, and even the history of the cases was insufficient to throw light on the nature of the affection. These were cases in which there was no evidence of the existence of any primary affection. In the complications of syphilis with scrofula, iodine was found to be the remedy most to be depended on, though it occasionally failed to effect a cure.

The external causes of scrofula form the third part of M. Lugol's work, in which he endeavours to determine what is the exact influence of external agents in the production and propagation of scrofula. He first examines into the causes of endemic scrofula. Scrofula is so prevalent in some districts, that it may truly be said to be endemic, few of the inhabitants being free of it. After a careful examination of the subject in many districts of France, the Pyrenees, Sweden, Italy, and Spain, the author shows that it cannot be attributed to anything particular in the locality, as other places, apparently in every respect alike as to this, escape the disease. He shows that a man originally healthy does not become scrofulous by inhabiting a locality in which the disease is endemic, neither do his posterity in the first generation. It is only after intermarriage with the scrofulous inhabitants that the hereditary disease is transmitted to the offspring. And he mentions the astounding fact, that from this cause families which have come healthy to Paris, may, within three generations, become so thoroughly scrofulised, that that malady produces the extinction of the whole family. Scrofula in this respect is quite unlike ague; indeed, late researches have proved that where the one disease prevails, tubercular affections are exceeding rare. M. Lugol next shows, that in districts, villages, or towns where scrofula is extremely prevalent, or is endemic, it probably owes its prevalence to intermarriages with scrofulous families. He mentions that he is acquainted with several large towns and cities, where not even one in twenty are free from scrofulous taint; and he attributes the exceeding prevalence of that disease among the inhabitants of Nice to the fact of so many scrofulous or consumptive patients resorting to it, and intermarrying with the inhabitants.

The author expresses his opinion very strongly relative to the baneful influence of the antiphlogistic treatment of the venereal disease, asserting that this plan of treatment is a fruitful cause of the production of scrofula. He strongly counsels to have recourse to the moderate employment of mercurials, as the only safe and efficient means of eradicating the disease, and preventing the development of scrofula. He believes that the great prevalence of scrofuleus diseases in Spain is owing to the neglect or insufficient treatment of the venereal disease in that country.

Not less powerfully is M. Lugol's voice raised against intermarriages amongst relations. He shows, from a reference to villages which have little intercourse with their neighbours, that all soon become related to each other by intermarriage, and consequently that soon the whole population of the village exhibit the scrofulous diathesis. He points out, that the same men, in the breeding of their cattle, take especial care to cross with distant races, in order that the delicacy which results from breeding in and in may not be developed,—yet the same men neglect what more especially concerns their own happiness, viz. their own offspring, and by marrying a relation, to a certainty engender scrofulous children. It is to this cause, viz. the intermarrying of relations, that M. Lugol traces the excessive prevalence of scrofula among the inhabitants of certain mountain districts, such as those of Auvergne, of Cevennes, of the Alps, of the Pyrenees, &c. From this cause the noble families of Jersey and of Spain have been well nigh extinguished from scrofulous disease; and indeed the aristocracy of every country, from confining themselves too exclusively to intermarriage with each other, have done much to extinguish their families. It is remarked that this has even happened to a great extent with the Jews, whose race, once so fine, has been decimated by scrofulous diseases, and is manifestly sinking into a condition of absolute degeneration. M. Lugol strongly insists on the necessity of crossing the blood in order to stay the progress of scrofula; for it is only by successive crossings we shall be able to eradicate the taint from, and fortify the constitutions of the population who have long been its victims.

The influence of climate and season on the progress of scrofulous diseases forms the subject of the second chapter. M. Lugol asserts that climate has no special influence on the development of scrofulous diseases, seeing that these diseases assume the same types, and are equally prevalent under all latitudes. He points out, however, that natives of the tropics have scrofula in its worst and most incurable form excited in them by a residence in a colder climate; they are therefore notable exceptions to the sweeping conclusion of the author, that "no climate can convert an originally healthy man into a scrofulous subject." We know, besides, that all the animals from warmer climates in our menageries die from tubercular, that is, scrofulous diseases. As to season, M. Lugol remarks, that, as a general rule, the first invasion of scrofula takes place in spring; and that the disease experiences a regular exacerbation on each return of that season. Great assistance as to the prognosis is derived from a careful observation of this fact. If the annual vernal recurrence of the disease begins to diminish in intensity, then we may be assured the case is in progress of cure; if otherwise, the case is progressing.

In the third chapter the author takes a rapid view of some of the external occasional causes of scrofulous diseases, and endeavours to demonstrate that the causes usually regarded as capable of producing it, such as moisture, insufficient food, confined rooms, &c. are insufficient for its production, and that in almost every case the disease may be traced to a hereditary taint. With something, however, like inconsistency, he states that "scrofula would likewise be less common among the labouring classes if their aliment was more abundant and substantial; if they were not obliged to work beyond their strength for the lowest wages; and if those trades could be deprived of their injurious characters, which now reduce the artisan to a state of constitutional debility, by which his reproductive powers are so deteriorated that his posterity must necessarily be scrofulous."—P. 213.

Before, then, proceeding to notice Dr Ranking's Essay on the Treatment of Scrofulous Diseases, let us for a moment endeavour to generalize on the facts brought before us by Lugol, and attempt to ascertain what scrofula really is.

We have seen that scrofula is not only propagated by hereditary descent, but may originate from a very great many accidental causes—may, in fact, be produced by any cause which weakens the powers of life. Lugol does not allow that these causes can of themselves produce scrofula in a healthy individual, but states that his offspring are sure to be scrofulous. His own facts, however, contradict him. Healthy negroes and natives of the tropics coming to reside in the more temperate zones almost invariably die of scrofulous diseases, and the same happens with the lower animals; and we cannot doubt that the very same causes which produce scrofula in them induce it also in the natives of the temperate climates themselves, even though M. Lugol endeavours to prove, and not always successfully, that they must have inherited it in some way or other from their parents. The occasional causes, therefore, do produce scrofula in the healthy individual himself. If such be the case, then, scrofula is just another name for "a class of diseases induced by weakness or debility," and whatever will strengthen the individual will avert the development of scrofula. That this is in reality the case is proved by what we now know of those tubercular deposits which occur in the scrofulous subjects. In them life is languid; the functions of life are feeble; and if from any accidental cause their systems are disordered, imperfectly organized matter is deposited in the glands, in the lungs, or over the body, instead of that highly organized form of matter which would have united with these parts and formed an integral portion of their healthy structure. All these tubercular deposits are albuminous—the crudest form of organized azotized matter—in fact, consist of irregular particles of solid albumen thrown out in a mesh work of crude cellular tissue. Wherever albumen in its crude state is thrown out, it is usually associated with more or less phosphatic earth, and the scrofulous tubercles form no exception to the general rule. Scrofula, then, in all its forms, is purely debility, weakness, delicacy; and every day's experience proves more and more the correctness of this conclusion. How very frequently do we find the largest glandular swellings disappear under the influence of country air and exercise alone, without the aid of any medicine whatever; and how often do we see one of an eminently scrofulous family live to a good old age, by simply using means to strengthen the general system.

We have said that scrofula in all its phases was simply debility or weakness; we ought to have said debility or weakness of the solids of the body. This is a fact which appears to derive some probability from the researches of several French and Italian physicians. They attempt to show that scrofulous diseases, consumption in particular, are almost unknown in all marshy or fenny districts of country where agues prevail; and they revive the oft-repeated aphorism that consumptive complaints may be removed by a residence in marshy districts. We should like to see the fact well established before any explanation is attempted. But it is important to observe, that all facts seem to prove that scrofula is essentially dependent on a relaxed and debilitated state of the solids, while all the diseases to which those living in marshy districts are liable are essentially connected with a diseased state of the fluids of the body. Look, for instance, at the swollen eyelids, swollen lips, hypertrophy of the cellular tissues, swollen joints, soft muscles, enlarged glands, &c. and the deposition of solid tubercular matter in the scrofulous. Nothing of all this occurs in those living in marshy districts, but, as has been shown by Salvagnoli and others, these fluids are in a highly diseased state. The fibrin and albumen of their blood are greatly diminished, the phosphates are nearly gone from it, while the fatty matters have assumed the form of cholesterine. The aguish diathesis is therefore essentially and primarily dependent on a diseased state of the blood, which secondarily may involve the solids; scrofula is essentially and primarily dependent on a weakened and diseased state of the solids, which secondarily may involve the fluids.

This view contributes to show how and why the accidental causes should give rise to the production of scrofula both in the individual exposed to their influence and to his offspring. It has been long known to breeders of cattle that a weak sire or dam never has a robust progeny, and it cannot be otherwise with man. But it is also a known fact that crossing the breeds tends to invigorate the progeny, and to produce a healthier and stronger race than either of the parents. Judicious pairing would therefore eradicate scrofula from the most scrofulous families, provided those accidental causes were avoided, which are, perhaps, after all, the most fruitful sources of the complaint. We are far from thinking with Lugol, that those affected with any form of scrofula ought to be prevented from marrying, for had this been the chief way in which scrofula was kept up, and was every one scrofulous who could trace to any of his progenitors a scrofulous affection, the human race would long ago have been extinct. But it is with man as with the domestic animals. Marriage, the crossing of the races, is the very way in which the hereditary tendency to disease is got rid of; and though one family, from an imprudent connection, may be cut off, another by chance crossing with a healthy stock is reinvigorated. Seeing these are our views, we can neither agree with M. Lugol nor his learned translator, that "the chief cause of scrofula is to be sought for in the selfish inconsiderateness of parents who have yielded to the natural impulse which leads them to increase their species, without a due regard to those moral restraints which should always operate as a check upon the eagerness of mutual attachment." The very circumstance of the union of the sexes being a natural impulse, and marriage a Divine ordinance, suffice to answer such a statement. Who are to be made the judges of the propriety of a marriage between any two parties? If themselves, they see no fault in each other; if their friends, none will acknowledge to either party being scrofulous; or if one be delicate, it is but too natural to hold that it is an additional reason for marriage, that the one may be nursed more carefully by the other. All that can be done, or ever should be done, is to recommend to those who present the scrofulous tendency strongly marked, to use the means best fitted for preventing as much as possible its development, viz. not to marry before 25 nor after 40, to avoid, above all things, an alliance with a blood relation, or with a person having the same predisposition as themselves, and to use the means best fitted for the eradication of the scrofulous diathesis in their own persons.

Dr Ranking, in his Essay on the Treatment of Scrofula, recommends that the child born of scrofulous parents should be suckled by a healthy nurse not longer than ten or eleven months. From our own observation, this period is too long; the suckling ought never to be prolonged beyond nine months. At this period, we have remarked that with most women, the nature of the lacteal secretion changes, and acts perniciously on a delicate child. Besides, the usual farinaceous articles of diet, the child should every other, or every day, have some animal broth. In our own practice, we find animal broth frequently to disagree with delicate children, but have never yet met with an instance in which they were not much benefitted by solid animal food, given in the form of well dressed mince meat, well boiled beef, or steak. Children of nine months will readily take all these, and in a few days come to prefer them to all the farinaceous articles of diet. Mutton, veal, lamb, and fowl frequently disagree with infants; nothing but tender beef ought ever to be given. It is recommended to keep the scrofulous child in the country if possible, and as much as possible in the open air, to attend to the ventilation of the apartment in which it sleeps, to defend it by suitable warm clothing from the variations of temperature. Cold bathing and spunging seem also to strengthen the system. Similar treatment should be continued during the period of youth; and especial care should be taken in the treatment of their complaints, to effect a cure with as little waste of the constitutional powers as possible, seeing that the adoption of active, but especially of depletive treatment, may be the means of developing scrofula. Dr Ranking adds, that in most cases of the strumous diathesis, the functional derangements of the stomach and bowels which usually attend, require the occasional exhibition of a gentle laxative, as the *Hyd. c. creta*, with rhubarb, and the employment of iodine at intervals. By the adoption of such means, " in the majority of cases, although we may not be able to guarantee the freedom from scrofulous symptoms in their posterity, we shall, if the case be taken in hand sufficiently early, be justified in promising, as far as the patient is individually concerned, a greatly amended state of constitution."—P. 239.

In introducing the general treatment of scrofula, Dr Ranking remarks, that, with the exception of consumption and hydrocephalus, the greater number of scrofulous diseases may be readily brought under the control of a well-directed medical treatment—a result chiefly due to the researches of M. Lugol.

All scrofulous diseases are benefited by an animal diet, and the moderate use of porter or wine, by exercise in the open air, by the judicious employment of sea bathing, and residence in the country. It is useful to commence the treatment by the exhibition of a purgative during two or three days. Dr Ranking prefers one composed of rhuburb, calumba, and *Hydrarg. c. creta*, which he repeats once every three weeks during the iodine treatment. Iodine is the essential part in the treatment of scrofulous diseases; and if British practitioners have failed to perceive its full value, it is because they have given it in too large doses, so as to procure its irritating, but not its tonic and specific effects. Lugol's formulæ for the administration of iodine are three in number; No. 1 contains three-fourths of a grain of iodine and one and a half grain of the iodide of potassium to eight ounces of water; No. 2 contains one grain of iodine and two grains of iodide of potassium to eight ounces of water; and No. 3 contains one one-fourth grain of iodine with three grains of iodide of potassium to the same quantity of water. He commences the treatment of all cases by giving three-fourths of No. 1 daily for a fortnight, and then the whole daily for another fortnight, when he gradually increases the dose to No. 2 and No. 3, but never exceeds this quantity. He recommends that half the daily quantity be taken before breakfast, the remainder an hour before dinner. Whenever it is seen that the system is becoming habituated to the remedy, it is to be interrupted, and a laxative given for a day or two, when it may be resumed, with the effect of causing the scrofulous sores again to assume a healthy aspect. If it manifest poisonous symptoms, as frontal headach, heat and itchings of the conjunctiva and nasal mucous membranes, pain of stomach resembling gastrodynia, the iodine must be given up for a few days, and diluents and aperients employed. Combined with the internal employment of iodine, it is useful to employ it in the state of bath, ointment, and injection. The bath itself ought to be made of wood or marble, as the iodine forms soluble compounds with zinc, lead, or tin. The formula is two or three drachms of iodine with four or six drachms of iodide of potassium to 60 gallons of water. After this bath the discharge from scrofulous sores is greatly diminished, and the appearance of the ulcers much improved. Lugol applies to indurated scrofulous tumours the following ointment:—iodine twelve grains, iodide of potassium four drachms, lard two ounces. For lotions to ophthalmia and sores, M. Lugol employs the iodine solution of three different strengths, viz. eight, nine, and twelve grains of iodine to six ounces of water.

Dr Ranking then describes in detail the special treatment adapted to the scrofulous affections of the glandular system, of the skin and cellular tissue, of the mucous membranes, and of the osseous system. In enumerating the treatment best fitted for the cure of glandular affections, Dr Ranking follows Lugol in condemning the abstraction of blood, whether by leeches or cupping. He is convinced that no benefit is derived from the abstraction of blood in any form of scrofulous disease. The tumours ought to be rubbed with iodine ointment every day, and the formula of the London College is recommended; but it is desirable to dilute it with lard when applying it on children with delicate skins, as it is apt to induce inflammatory action in the tumour if too strong. In our own experience, the iodine ointments ordered by the London and Edinburgh Colleges are too strong for ordinary use; the slightest over application of ointment or rough friction in its application being apt to induce inflammatory action. In every case we have found it preferable to dilute it with two parts of lard, and never have had occasion to complain of its being too weak. If there be great tenderness over the tumour, it is recommended to apply tincture of iodine, by means of a camel's hair pencil. Ioduretted baths, and the internal administration of Lugol's solution of iodine, or the *Syrup. Iodid. Ferri,* and an occasional purgative compose the rest of the medical treatment. Should suppuration commence, it is advised still to continue the iodine regimen till fluctuation be distinctly felt, and then let out the matter by puncturing with a broad-shouldered lancet. Water holding two or four grains of iodine in solution may then be injected, retained there for a minute or two, and then compresses of lint applied. Should the abscess not heal, and the edges of the puncture threaten to undermine, by the continuance of the suppuration, the abscess may be opened by a free incision.

Glandular affections of the bronchial glands, of the mesentery (*tabes mesenterica*), &c. are to be treated on the same principle. Cod-liver oil has been recommended for the mesenteric affection; but the author has had no experience of its curative action.

For the indurated hypertrophy of the lips, *alæ nasi,* &c. the best application is the iodine ointment, or tincture, used daily. For the rounded or oblong dull red projections which break and form small irregular ulcerations, ointment of the iodide of mercury, and the internal use of sarsaparilla, with the iodide of iron, is recommended. That form of corrosive scrofulous ulcer resembling that known as lupus, in most cases requires to be touched with some caustic, the most efficacious of which is one formed of chloride of zinc and gum tragacanth, or flour, in equal parts, formed into a paste. This is spread about two lines thick over the part to be acted on, and allowed to remain there for twelve hours. In five or six days the eschar is detached, and the surface below generally presents a fresh granulating aspect. The numerous skin diseases which attend teething, as eczema, impetigo, *crusta lactea,* &c. as well as those observed at a later period of life, as scald head, &c. indicate a scrofulous taint, and are much benefited by being treated accordingly. The scrofulous abscesses which occur wherever cellular tissue abounds, as those under the jaw, psoas abscess, &c. are recommended to be treated on the same principles as other scrofulous affections; though relative to psoas abscess, Dr Ranking has never known a case of recovery where the disease was complicated with disease of the vertebræ. Even in these cases, however, he, in common with Lugol, recommends exercise to be taken in the open air, and that the patient should by no means be confined to his bed. Where the abscesses are large, and in communication with diseased or carious bones, it is recommended to delay opening them as long as possible, meantime improving the patient's strength to the utmost, and then to open them at the most dependent portions, and by valvular openings, drawing off a portion only of the contents, and healing the wound by the first intention. For other abscesses, it is preferable to open them whenever fluctuation can be distinctly perceived, and excite the cyst to healthy action, by means of Lugol's iodine injection. Many valuable hints are given as to the minute rules to be followed in these and other cases, which would well repay the labour of a diligent perusal.

The scrofulous affections of the mucous membranes consisting of affections of the digestive organs, of the bronchial mucous membranes, of the female genital organs, of the pituitary membrane, of the eye and of the ear, are treated on the same general plan as other scrofulous affections. In the leucorrhœa of scrofulous females, the internal use of the iodide of iron proves highly beneficial, conjoined with the employment of stimulant injections. In otorrhœa, injections with or without iodine prove highly useful, and when combined with the internal use of iodine, will frequently effect a cure. The continuance of the disease is apt to induce caries of the mastoid cells and destruction of the hearing. The discharge is then fetid, and injections are more necessary than ever. Those containing iodine greatly diminish the discharge, though they may fail to effect a cure. Scrofulous ophthalmia composes nine-tenths of the attacks of ophthalmia to which children are liable. Leeches, cupping, and blisters, are highly objectionable in the treatment of this affection, as are also shades and darkened rooms. The patient ought to pass the greater portion of his time in the open air, and trust to the effect of good food, tonic medicines, as quinine and iodine, and stimulant local applications, of which Dr Ranking prefers the nitrate of silver.

The treatment of scrofulous affections of the osseous system constitutes the last chapter of Dr Ranking's Essay. The disease chiefly attacks the bones, in which the cancellated structure abounds, and has for its essential pathological condition the deposition of tubercular matter. Spinal curvature, with or without lumbar abscess, hip-joint disease, and white swelling, are the chief forms of scrofulous disease of the bone; and in no scrofulous affection is it more necessary to attend to the constitutional treatment. The digestive organs must be maintained at their maximum degree of force by a wholesome and liberal diet, pure air, and tonic medicines. Of these last, Sir B. Brodie gives the preference to preparations of iron, or to *Liquor Potassæ* in bitter infusion. But it is to iodine we are especially to trust, and it must be continued perseveringly for years. The great secret of M. Lugol's success in curing scrofulous disease of the bones is his being able to induce his patients to persevere in this remedy till the cure is effected. The hectic fever and failure of the vital powers often rapidly give way after the iodine treatment is commenced. The most remarkable, and at the same time successful innovation of M. Lugol in the treatment of these scrofulous affections of the bones is his causing all his patients to walk about in the open air, and not allowing them to confine themselves to their bed or to the horizontal position, as all other practitioners recommend. Dr Ranking would keep his patient in the horizontal position if he suffered from vertebral caries, but keep him much in the open air by making his couch a carriage. Topical blood-letting, the cautery, and blistering are condemned as in most cases useless, only weakening the part they ought to strengthen. Compression, however, is very useful in almost all cases. Iodine frictions, baths, ointments, and injections are also useful, according to the stage of the disease, though they appear to have less powerful action on the diseases of the bones than on the scrofulous affections of other parts.

Dr Ranking then considers the propriety of removing a limb which the above recommended treatment fails to cure, and which seems to be exhausting the patient by profuse suppuration. Such an operation is contraindicated if there exist disease of other joints, or tubercular disease of the lungs or glands, and if these do not exist, it is very questionable whether amputation ought to be had recourse to, seeing that M. Lugol states that after puberty scrofulous affections rarely if ever prove fatal, unless conjoined with tubercular disease of the lungs. As continued perseverance, therefore, in the above recommended means hold out the prospect of a recovery even in the worse cases of diseased joints, amputation ought very rarely if ever to be had recourse to. Even when necessary, it ought only to be adopted in the case of the lower extremities, seeing that the excision of the joints of the upper extremities, as recommended and practised by Mr Syme, seems a much more useful operation for those of the upper extremities. This last removes the source of the exhausting discharge, and leaves afterwards a useful limb,—a matter of especial consequence to the lower classes, whose means of livelihood depend on their being able to perform manual or handicraft labour.

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## ART. VI.—*Lectures on subjects connected with Clinical Medicine, comprising Diseases of the Heart.* By P. M. LATHAM, M. D., Fellow of the Royal College of Physicians, Physician Extraordinary to the Queen, and late Physician to St Bartholomew's Hospital. In two volumes. Vol. i. London, 1845. 12mo. Pp. 374.

THESE lectures are in number seventeen, and they are devoted to elucidate the diagnosis, pathology, and treatment of diseases of the heart, either alone or in connection with rheumatism, and to the treatment of acute rheumatism also, without disease of the heart.

Dr Latham is at much pains to explain the diagnostic value of endocardial murmurs, and to rectify several erroneous notions on them, and dwells with great clearness and force on the doctrine of regurgitation, and the effects of that phenomenon on the symptoms of cardiac action.

In the first place, the outlet of the aorta may be contracted or narrowed, so as to prevent the blood from passing freely out of the ventricle into the aorta. This gives rise to one kind of morbid murmur, synchronous with, and accompanying the systole; but it is not that of regurgitation.

But, secondly, a single murmur heard uniformly coincident with the diastole, found also after death to be connected with some imperfection of one valve, might justly be presumed to be associated with defective function of that valve,—in short with regurgitation.

Again, in a third class of cases in which two murmurs were heard during life, one coincident with the *systole*, the other with the *diastole*, the latter only, it was found, was the murmur of regurgitation.

Then it appears that the aortic valve might be the seat of two sorts of murmur, one regurgitating, the other not.

Again, in a fourth class of cases, in which a single murmur was heard coincident with the systole, it was found that the mitral valve alone was diseased, while the aortic valve was sound. This, again, can be explained only by admitting regurgitation of blood into the auricle. He infers that while the aortic orifice may be the seat of two murmurs, the mitral can be the seat only of one, and that always a systolic murmur from that valve implies regurgitation.

He attaches due importance to the value of endocardial murmurs, as indicating the existence of disease within the heart, and usually about the valves. But he does not approve of the minute distinction of these murmurs, as he thinks such distinction and denomination cannot admit of practical utility in diagnosis or treatment, (p. 52.)

The endocardial murmurs arise under circumstances so variable and different, that it is always indispensable for the physician to study carefully these circumstances, as in each they indicate different states. The bellows' murmur he regards as connected with rheumatism of the endocardium, (p. 103.)

Exocardial murmurs are not less important. These, which have been variously named, as crumpling, creaking, churning sounds, are connected with inflammation of the pericardium.

In acute rheumatism, these inflammatory affections of the heart are much more common, he thinks, than is usually believed.

" Between the years 1836 and 1840, both inclusive, there occurred under my care, at St Bartholomew's Hospital, 136 cases of acute rheumatism.

“ Of these 136 patients, 75 were males and 61 were females. Of the 75 males, the heart was affected in 47, and unaffected in 28.

“ Of the 47, the seat of the disease was the endocardium alone in 30, the pericardium alone in 3, and both the endocardium and pericardium in 7. And while the heart was undoubtedly affected in 7 others, the exact seat of the disease was uncertain.

“ Of the whole number of males in whom the heart was thus variously affected, 3 died, and in these 3 the pericardium and endocardium were both inflamed.

“ Of the 61 females, the heart was affected in 43, and unaffected in 18.

“ Of the 43, the seat of disease was the endocardium alone in 33, the pericardium alone in 4, and both endocardium and pericardium in 4, and the exact seat of the cardiac disease was doubtful in 2.

“ Of the whole number of females in which the heart was thus variously affected, none died.

“ The account of males and females taken together will stand thus :—

| | | | |
|---|---|---|---|
| “ Cases of acute rheumatism, | | 136 | |
| Heart exempt in | | | 46 |
| Heart affected in | 90 | | |
| Seat of disease in the heart. | | | |
| Endocardium alone, | 63 | | |
| Pericardium alone, | 7 | | |
| Endocardium and pericardium in | 11 | | |
| Doubtful in | 9 | | |

Deaths, 3 ; both endocardium and pericardium affected.”—P. 141–144.

From these facts, Dr Latham infers that inflammation of the heart is in acute rheumatism a much more frequent occurrence than is usually imagined. It appears, also, that endocarditis occurs nine times in acute rheumatism, for pericarditis, once ; that simple *endocarditis* constitutes more than two-thirds of all rheumatic cardial affections, and simple pericarditis only one-thirteenth, and that pericarditis is more frequently found with endocarditis than alone.

Simple rheumatic endocarditis seems, nevertheless, to be a curable disease, and not very frequently to be fatal. Among 68 persons, male and female, who suffered this disorder, none died. But it appears that the endocardium rarely recovers its previous integrity. Symptoms of its remaining permanently injured took place in 46 persons.

In explaining the principles of treatment, which is done at some length and with much care, Dr Latham considers remedial measures as applied to rheumatism, and those as applied to inflammation of the heart. In the former, while he advocates the necessity of viewing the disease as inflammatory, and therefore recognises the necessity of employing antiphlogistic measures; he does not, however, recommend the sole and exclusive adoption of these measures. A mixed or compound method he regards as more judicious and more effectual. Thus he recommends moderate, not large or profuse blood-letting, evacuation of the alimentary canal and its connected glands by calomel and the saline infusion of senna, and opium in moderate doses to allay irritability and alleviate pain, (p. 201–209, 245–259.) Mercury, also, given so as to affect the system, he regards, as in various forms of the disease, highly useful and necessary.

On the use of this mineral in the treatment of various chronic diseases attended with inflammation, Dr Latham enters, in his fourteenth lecture, into a lengthened disquisition, containing many good practical remarks. In the exhibition of the mineral he recommends, after full blood-letting, calomel in large doses, half a scruple or one scruple at once, and to be repeated at the end of six or eight hours. Salivation, he says, must be produced speedily, as upon its production in the course of one or two days the life of the patient may depend. This, however, must be practised only in cases of violent inflammation and vigorous action of the vital powers.

In cases, on the other hand, in which the inflammatory action is of little force and slow in progress, after local bleeding he thinks it better and safer to trust to more moderate doses, viz. one or two grains of calomel once or twice daily.

The employment of this remedy is further most useful, nay, indispensable in many cases, both of *pericarditis* and *endocarditis*, and often we find that repeated blood-letting, general and local, and every part of the antiphlogistic regimen, is unavailing in controlling the morbid action, until mercury is administered and ptyalism produced.

The great influence of this remedy in *endocarditis* leads him to ascribe to it high reparatory powers, (p. 299, 300); and in proof of this he states, that since, by means of auscultation, the diagnosis of the disease has been rendered certain, it has not in a single instance proved fatal, in cases in which mercury has been administered, and this with but moderate venesection. In the practice of M. Bouillaud, on the other hand, in which the treatment has been vigorously antiphlogistic without the use of mercury, the disease has been remarkably fatal.

These lectures are remarkable for their impressive and interesting manner; for the value of the information which they communicate; and for the strong practical character which they present. They should be carefully studied, and we have no doubt that they will be studied with interest and advantage.

## ART. VII.—*A Bill (as amended by the Committee) for Regulating the Profession of Physic and Surgery.*

IN the Medical Intelligence will be found the proposed Bill for regulating the Practice of Medicine and Surgery changed and amended by the Committee.

The changes are various, and it is impossible to consider all of them in detail at present. The most important change, however, which the measure presents, is that directing the formation or institution of a College of General Practitioners. This has so altered the whole character of the Bill, that it is not only equivalent to making it a new measure, but a measure so different from what was contemplated, that it seems now very doubtful whether it will ever be carried into effect. The most extraordinary part of this proposition to institute a College of General Practitioners, is, that its hurtful effects, both on the profession at large and on the existing corporations, appear not to have been foreseen. This, however, we think, did not require a large amount of sagacity. For if this College were to acquire any standing, weight, influence, or reputation, either with the public or the profession, it could have been in no other mode, than as a rival to the College of Surgeons of England, and to the great injury, if not the certain ruin of that institution.

This proposed College of General Practitioners is to take cognizance of Medicine, Surgery, and Midwifery, and we presume Pharmacy, in short, all the departments of Medicine and Surgery, and to examine and license candidates therein. In taking cognizance of Medicine, if it do so efficiently, it must interfere with the duties hitherto performed by the Universities and the Colleges of Physicians. In taking cognizance of surgery, and ascertaining the competency of candidates in that science, it must interfere with the Colleges of Surgeons.

If candidates for letters testimonial in medicine and surgery can obtain these letters by appearing before the Board of the College, they will never think of going before the superior and more scientific boards of the Universities and the Colleges of Physicians and Surgeons. All experience shows that what can be procured in an easy way, however discreditable, no man will ever attempt to procure in a difficult manner, however honourable. The effect of this will be, that the universities and colleges will be depreciated, and good systematic education will be despised, and science will be neglected, while the inferior College of General Practitioners will rise upon their ruins, to the utter destruction of medicine and surgery as scientific and liberal pursuits.

And who, pray, are the general practitioners for whose sake and advantage all this degradation and mischief is to be perpetrated? Are they not a body of men, 99 in 100 of which are most imperfectly educated, all engaged in the trading, money-making parts of the profession, and not one in 100 of them distinguished by anything like science or liberality of mind? Is it not the fact that the small, the very small number of general practitioners who are eminent or distinguished, derive this distinction from being members of the College of Surgeons; and would have been eminent men whether they had been of the order of general practitioners or not?

As to these men examining in medicine and surgery, and ascertaining the qualifications of candidates in these branches of knowledge, the thing is a farce, an absurdity, a perfect chimera, and never could enter into the head of any person who knows either what medicine or surgery is, or what sort of persons general practitioners are. We should be glad to be informed how many individuals among the general practitioners of England and Wales can, after twelve or fourteen years' practice, be capable of examining on the pathology and treatment of diseases of the brain and spinal chord, or, in short, on any disease of the internal organs; or how many could ascertain the knowledge of a candidate in surgery or the pathology of aneurism, hernia, or diseases of the joints. The moment this precious college commences its function, the golden days of medical and surgical science in England are gone. These have flourished as sciences and liberal arts, because they have been cultivated by scientific well educated men, who devoted to each exclusively their whole time and energies. They will be degraded, pine, wither, and die, the moment they come under the patronage of the practitioners. This measure, in short, instead of serving the profession, will most seriously degrade and depress it. This is certainly not for the public good.

To this institution, however, there is still another objection, that it must injure the College of Surgeons, a body to which, both as a corporation, and also individually, medicine and surgery, both as a science and as an art, owe more than to all other institutions besides. It is the high character of this body, and of its individual members that have been to the public for more than 100 years the warrant of the competency and qualification of those who obtained its license. It has risen, and at the same time raised the profession; and whatever be its faults or its errors, that of degrading the profession cannot be laid to its charge. The colleges have laboured to bring the profession up to a certain standard. But this measure will have the opposite effect.

It is, therefore, not astonishing that the College of Surgeons have made, in the memorial which we publish, a strong remonstrance against the creation of this College of General Practitioners. The college oppose it on the grounds of the injury it must do to that institution. To us the measure appears to be objectionable, because it injures the profession at large, and none more than the general practitioners themselves. All these persons begin in this capacity the exercise of their profession. But all hope to ascend above this rank, and become either surgeons or physicians before the end of their career. In the new way this is impossible. Once general practitioners, they are so for ever. They can never hope, unless on the ground of being originally examined and certified by the universities, or colleges, to be received as certified members by either. The measure is the most unwise, the most pernicious that could be devised.

[APPENDIX TO ORIGINAL COMMUNICATIONS.]

## *Supplement to Mr Roberton's Paper on the Period of Puberty in Hindu Women.*

I have this day received from India, by the kindness of Dr Webb, Professor of Military Surgery in the Calcutta College of Medicine, the following additional tables, illustrative of the age of menstruation and the age of first pregnancy in the women of Hindustan. I need hardly say that these researches, obtained by Professor Webb and others, through the instrumentality of Hindu students of medicine, show that the censure I ventured to pass on the supineness of our Colonial and East Indian medical practitioners was premature, and I rejoice that it has so speedily received the best and most agreeable kind of rebuke, namely, a practical refutation.

### *On Menstruation among Hindu Females.* By Baboo Modusoodun Gupta.*

At the request of my friend Dr Webb, I have the pleasure to forward the testimony afforded by our most authoritative ancient writers upon this subject, and also the result of my own observations.

*1st.*—SUSHRUTA says, "The menstrual discharge begins after the twelfth, and ceases after the fiftieth year. The discharge returns every month, and lasts for three days."

Again, SUSHRUTA says, "If a man under twenty-five deposit his germ (*garbha*) in a woman younger than sixteen, it will (most likely) die in the womb. Even if it be born alive, it will either soon die, or he will be imbecile and weakly so long as he lives."

*2d.*—ANGIRA, one of the Hindu lawgivers, says, "that females are called *Gouree* when they are eight years old; they are called *Rohinee* at the ninth year; *Kangaka* at the tenth year; and after the tenth they are called *Rajaswala*, or a female with menses."

*3d.*—ATRI and KASYAPA (Hindu sages) state, that "if an unmarried girl discharges the menstrual fluid at her father's house, the father incurs a guilt similar to that of destroying a fœtus, and the daughter becomes *Brisalee*, or degraded in rank."†

I find it enjoined in the Hindu Shastras, that females should be given in marriage before their first menstrual discharge, and that, should marriage not take place until after this event, the marriage is regarded in a sinful light.

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* Native Demonstrator of Anatomy to the Medical College, Calcutta, and Honorary Member of the Medical and Physical Society.

† The Baboo has supplied the original Sanskrit for each of the foregoing extracts from ancient Hindu authors, which, being unable to transcribe, I am compelled to omit.

According to my own observation, the females of this country generally arrive at the age of puberty (or womanhood) after the twelfth year, when they are fit for all the purposes of marriage. I think our celebrated *Manu* very judiciously fixed the time of marriage of females at twelve with men of thirty years old. Most of the females of this country begin to menstruate after the twelfth year, or at the beginning of the thirteenth, and it continues till the fortieth, in some cases forty-fifth. At the age of ten years it is very uncommon, and it is perhaps equally rare for it to be delayed beyond the thirteenth year. When the discharge takes place it lasts for three or four days.

As a general result of my investigation, I do not find that menstruation occurs at so early an age as ten years in more than one or two instances out of a hundred females. I beg to observe that it is a very easy matter for native practitioners to ascertain the actual epoch of a first menstruation, since it is the custom among Hindus to publicly notify to all the relations and guardians of the female the important fact of menstruation, and celebrate it by certain ceremonies and religious rites called Punur Bibaha, or second marriage.

It is the custom of the country, in our early marriages, to send the girl, at perhaps nine years, occasionally to the house of her husband; but if the husband be so distant that this cannot be done menstruation is generally delayed till the thirteenth year.

I have been informed by several women that when the menstrual flux begins as early as the eleventh or twelfth year, it does not, in many cases, recur for a year after this first appearance, but after that period the secretion again takes its natural course. It may therefore be fairly questioned whether or not this, which is supposed by them to be a first appearance, may not be rather caused by the first act of sexual intercourse, and the result of a ruptured hymen.

They also mention that females occasionally become pregnant immediately after this first menstruation. I believe that the catamenia appear sooner or later according to the mode of living of the females, and the sexual excitement to which they may be subjected, as I find the first menstruation of girls of good circumstances generally takes place when they are eleven years old, even in some cases at ten years. I never observed a female of indigent circumstances to menstruate earlier than the age of twelve years.

Agreeably to the form furnished me by Dr Webb, I have the pleasure to annex the accompanying

*Table of Menstruation among Hindu Women.*

| Names.[*] | The age at first menstruation. | First pregnancy. | The age at present. |
|---|---|---|---|
| 1 | 13 | 13 | 25 |
| 2 | 13 | — | 32 |
| 3 | 12 | 14 | 21 |
| 4 | 13 | — | 30 |
| 5 | 13 | — | — |
| 6 | 13 | 16 | 22 |
| 7 | 11 | 14 | 21 |
| 8 | 12 | 12 | 17 |
| 9 | 13 | 14 | — |
| 10 | 12 | 13 | — |
| 11 | 11 | 11 | — |
| 12 | 13 | 14 | — |
| 13 | 13 | 14 | — |
| 14 | 13 | 14 | 21 |
| 15 | 13 | 14 | 15 |
| 16 | 12 | — | — |
| 17 | 12 | — | — |
| 18 | 12 | — | — |
| 19 | 13 | 18 | — |
| 20 | 12 | 14 | 15 |
| 21 | 12 | — | — |
| 22 | 12 | — | — |
| 23 | 13 | — | — |
| 24 | 13 | — | 26 |
| 25 | 12 | 14 | 30 |
| 26 | 12 | 15 | 30 |
| 27 | 12 | 14 | 20 |
| 28 | 12 | 14 | 21 |
| 29 | 13 | 14 | 30 |
| 30 | 13 | 15 | 28 |
| 31 | 11 | 11 | 14 |
| 32 | 13 | 14 | 25 |
| 33 | 13 | 15 | 30 |
| 34 | 12 | — | — |
| 35 | 12 | 14 | 24 |
| 36 | 12 | — | — |
| 37 | 12 | 15 | — |

*Instances of Menstruation late in Life.*†

| | | |
|---|---|---|
| 1 | Gopi Mohun Dey's aged wife, | 60 |
| ‡2 | Madhub Ram Bose's wife, | 50 |
| 3 | Gour Mohun Das's wife, | 65 |
| ‡4 | Kissub Ram Bose's servant, | 67 |
| ‡5 | Ramcoomar Mittra's wife, | 68 |
| ‡6 | Kassynath Ghose's wife, | 64 |
| 7 | Binda Bun Ghose's mother, | 58 |
| 8 | Nimychurn Bose's wife, | 56 |
| 9 | Ram Narain Sircar's wife, | 57 |
| 10 | Deby Kisto Dutt's wife, | 59 |
| ‡11 | Boli Ram Bose's wife, | 56 |
| 12 | Soroop Ghose's mother, | 80 |
| ‡13 | Shoobhul Taly's mother, | 63 |

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[*] Dr Webb says the names were furnished, but at the request of the Baboo they are withheld.

† These instances were furnished by Dwarikanauth Das Bosu, student of the College, now on his way to England, and author of Table II.

‡ These continue to menstruate.

TABLE II.—Showing the time the generative faculty continues active in women, natives of Bengal, (based upon the facts of age of woman at first menstruation, age at first birth, and the latest period at which children have been born.) Drawn up by Dwarikanauth-das Bosu, Assistant Curator, Medical College, Calcutta.

| Cases. | Age of Woman. | 1st Menstruated. | 1st Birth. | Cases. | Age of Woman. | 1st Menstruated. | 1st Birth. |
|---|---|---|---|---|---|---|---|
| 1 | 14 | 13½ | 14 | 48 | 16 | 14 | ... |
| 2 | 24 | 14 | 16 | 49 | 15 | 12 | ... |
| 3 | 18 | 14 | ... | 50 | 16 | 13 | ... |
| 4 | 24 | 14 | 16 | 51 | 30 | 11 | 12 |
| 5 | 13 | 11 | ... | 52 | 14 | 12 | ... |
| 6 | 20 | 12 | 17 | 53 | 17 | 13 | 14 |
| 7 | 14 | 12 | 14 | 54 | 15 | 12 | 13 |
| 8 | 22 | 12 | 13 | 55 | 19 | 14 | 16 |
| 9 | 20 | 14 | ... | 56 | 15 | 14 | ... |
| 10 | 18 | 13 | 15 | 57 | 19 | 14 | ... |
| 11 | 14 | 12 | ... | 58 | 18 | 12 | 13 |
| 12 | 16 | 8 | ... | 59 | 15 | 13 | 14 |
| 13 | 28 | 14 | 14 | 60 | 17 | 13 | 14 |
| 14 | 13 | 12 | 12 | 61 | 16 | 12 | 13 |
| 15 | 30 | 12 | 14 | 62 | 17 | 12 | 15 |
| 16 | 23 | 13 | 14 | 63 | 14 | 10 | ... |
| 17 | 15 | 14 | 15 | 64 | 15 | 13 | 14 |
| 18 | 32 | 11 | 12 | 65 | 20 | 14 | ... |
| 19 | 30 | 12 | 14 | 66 | 30 | 17 | ... |
| 20 | 25 | 13 | 14 | 67 | 13 | 11 | ... |
| 21 | 35 | 13 | 15 | 68 | 47 | 15 | ... |
| 22 | 31 | 12 | 13 | 69 | 47 | 12 | ... |
| 23 | 17 | 13 | ... | 70 | 16 | 12 | ... |
| 24 | 20 | 12 | 13 | 71 | 28 | 10 | ... |
| 25 | 21 | 17 | ... | 72 | 49 | 14 | ... |
| 26 | 18 | 14 | 15 | 73 | 36 | 11 | ... |
| 27 | 13 | 12 | 13 | 74 | 19 | 10 | ... |
| 28 | 17 | 14 | 15 | 75 | 15 | 10 | ... |
| 29 | 19 | 14 | 14 | 76 | 20 | 13 | ... |
| 30 | 21 | 13 | 18 | 77 | 35 | 13 | 15 |
| 31 | 13 | 11 | 12 | 78 | 28 | 11 | ... |
| 32 | 18 | 14 | 15 | 79 | 36 | 9¼ | 12 |
| 33 | 38 | 13 | 30 | 80 | 42 | 14 | ... |
| 34 | 17 | 14 | ... | 81 | 39 | 14 | ... |
| 35 | 16 | 14 | 14 | 82 | 52 | 14 | ... |
| 36 | 19 | 15 | 19 | 83 | 43 | 14 | ... |
| 37 | 20 | 12 | 13 | 84 | 55 | 14 | 15 |
| 38 | 14 | ... | 11 | 85 | 23 | 11 | 12 |
| 39 | 13 | 11 | 12 | 86 | 14 | 13 | 14 |
| 40 | 15 | 11 | 12 | 87 | 27 | ... | 12 |
| 41 | 16 | 14 | 15 | 88 | 34 | 14 | 15 |
| 42 | 17 | 14 | 16 | 89 | 30 | 12 | 13 |
| 43 | 12 | 11 | ... | 90 | 29 | 11 | 12 |
| 44 | 17 | 16 | ... | 91 | 32 | 14 | 15 |
| 45 | 17 | 13 | 16 | 92 | 39 | 15 | ... |
| 46 | 10 | ... | 10 | 93 | 27 | 14 | ... |
| 47 | 16 | 15 | ... | 94 | 15 | 14 | ... |

| Cases. | Age of Woman. | 1st Menstruated. | 1st Birth. | Cases. | Age of Woman. | 1st Menstruated. | Birth. |
|---|---|---|---|---|---|---|---|
| 195 | 14 | 13 | ... | 113 | 22 | 13 | ... |
| 96 | 16 | 14 | ... | 114 | 19 | 10 | 12 |
| 97 | 14 | 13 | ... | 115 | 17 | 11 | ... |
| 98 | 17 | 14 | ... | 116 | 21 | 14 | 16 |
| 99 | 16 | 14 | ... | 117 | 25 | 12 | 14 |
| 00 | 20 | 11 | 14 | 118 | 17 | 12 | 13 |
| 101 | 49 | When these menstruated I cannot correctly state. | [a] *39 | 119 | 20 | 13 | 14 |
| 102 | 72 | | 60 | 120 | 18 | 13 | ... |
| 103 | 45 | | 45 | 121 | 18 | 11 | 13 |
| 104 | 51 | | *50 | 122 | 25 | 11 | ... |
| 105 | 54 | | 51 | 123 | 26 | 13 | ... |
| 106 | 64 | | 62 | 124 | 25 | 11 | 14 |
| 107 | 70 | | †58 | 125 | 24 | 11 | 16 |
| 108 | 45 | | 40 | 126 | 20 | 8 | 11 |
| 109 | 47 | | 45 | 127 | 15 | 9 | 11 |
| 110 | 60 | | 60 | | | | |
| 111 | ‡65 | Yt.f.w. | 65 | | | | |
| 112 | 30 | No ms. | 11 | | | | |

Time does not permit me to offer more than one or two remarks on these Hindu tables, illustrative of the age of puberty and of the age of first pregnancy in Hindu females; nor is this material, as they so entirely agree with and corroborate in all particulars the table of Dr Goodeve, to be found in the body of my paper. The average age of puberty for the 90 instances of Dr Goodeve is 12 years and 4 months; and for the 149 instances in the two foregoing tables, the average age is (omitting fractions) 12 years and 7 months. The whole added together, amounting to 239 instances, gives the average age for the commencement of menstruation as 12 years and 6 months nearly.

The average age for a first pregnancy, calculated from 95 instances supplied in these tables, is scarcely two years higher than the average age of puberty,—a very remarkable and astonishing fact, as it proves the universal prevalence of marriage or sexual intercourse at, or, as it would seem, *before* the age of puberty.

I must likewise decline (for want of time) attempting to comment on what the reader finds in the Memoir of Baboo Modusoodun Gupta, though this will readily be admitted to furnish various particulars for serious reflection, with reference to the strange and affecting condition of native society in Bengal. The following remarks by Professor Webb, which I extract from his memoir entitled "Pathologia Indica," will, however, be found to supply a better comment than any which I could pretend to offer.

"As my object is the illustration of *Indian* pathology, I shall consider it my province to give especial prominence to all that relates to INDIA.

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* First birth. † Twins. ‡ Died.

[a] I understand the ages in brackets (with the exception of the two marked with an asterisk), to be those at which pregnancy, at a very advanced period of life, took place.—J. R.

"Now, it was upon an ancient theory respecting generation, very much resembling our own, that early marriages seem to have been instituted in India. It was said that if an unmarried girl has the menstrual secretion in her father's house, he incurs a guilt equal to the destruction of the fœtus; that is, according to the doctrine of Pythagoras and the theory of the ovists, all the material of the new ovum, and the ovum itself is formed by the female; menstruation was, therefore, the loss of the ovum or loss of the fœtus.

"How strange that a doctrine professing such regard for the generative germs should lead eventually to a reckless destruction of the fœtus itself. The ovum of the female, passing off unimpregnated, is equal to child-murder. To escape this great sin, *children* are married; and, at the tender age of eight, nine, or ten, before even this menstruation appears, are subjected to sexual intercourse; which, in some instances, is fatal to them. (See No. 204 of the preparations). By law they cannot marry again upon the death of the *boy spouse*. Nay, if a Hindu girl be but one only of the 100 wives of a Koolin Brahmin, whose only trade is marriage, she can never be released at his death even, but must always remain a widow. And unless the Government should vindicate nature's law, and do as much to suppress polygamy as polyandry, there seems no hope for them. Thousands of women are thus living in hopeless celibacy, surrounded by institutions and practices, if not wholly subversive of chastity, at least very unfavourable to it; indeed it has no other safeguard than the dread consequences of losing caste.

"The result of this state of things is a fearful amount of crime. Perhaps no country on earth has immolated so many new-born infants as India, nor has any race of mankind more generally practised the abominable art of murdering children when yet in the womb of the mother. The art of producing abortion and all its long train of evils, at once subverting both the order of nature and the end of being, is but too openly practised even now. Whilst the strong arm of a humane government has done much to cleanse the land from the foul stain of child-murder, it has not been able to reach this more common and secret practice of abortion, as many of the preparations in the museum sufficiently attest, and also that the death of the unfortunate mother is no uncommon result of this crime, which in other instances leads to hopeless sterility.

"Climate has generally been the apology for these early marriages, which the more enlightened Hindus call the "monster evils" of their country. But it is not common for girls in India to menstruate until after the twelfth year. I have known instances also in England of its taking place in the twelfth year. Those writers who lived in Europe before the fifteenth century, as the celebrated MICHAELUS SCOTUS and ALBERTUS MAGNUS, speak of the twelfth year as that from which menstruation begins. Mr ROBERTON of Manchester has been at much pains to prove that the age when this function begins, which is supposed to mark the commencement of the generative faculty in women, does not vary much in any part of the world; and I am happy to be able to confirm his views as respects this country. Girls even in India do not at once step from childhood to womanhood unless unnaturally *forced.* Out of a list of 127 Hindu females with which I have been favoured, it began only in six girls under twelve years of age, and, as many of them did not again menstruate until a year after this, which they believed a *first appearance*, it is probable, as suggested by BABOO MODUSOODUN GUPTA, that a ruptured hymen would better account for that. Thus 81 out of 127 are stated to have been twelve years old or upwards.

"Out of 80 cases thus furnished who had probably been subjected to the influences of impregnation from the age of 9 years, there were only 28 births under 14 years of age; but similar results would perhaps have followed similar circumstances even in Europe, as may be inferred from what occurs in the semi-barbarous conditions of society there, or where the bands of decency and order are rent asunder, during the great revolutions and convulsions of states. Besides what we have seen in the records of the French Revolution, ALDROVANDUS (1642) cites observations that prove births to have occurred in Europe at 8 and 9 years. HOME speaks of births at 12 and 13. Out of 127 cases reported to me of Bengalees, one birth is stated at 8 and one at 9. I have not found that East Indian girls, and European bred girls born in India, menstruate earlier than in Europe, and I have had, for nearly three years, a wide field of observation in the hospitals of the Government Orphan School, (under my charge,) in which there are rarely less than 200 girls. It is not common for menstruation among them to begin until 14. The fact of a first menstruation is always reported to the head mistress, who has never known one single instance of its occurrence before the age of 13. Very often it is delayed till 16, 17, or 18. There is no difference in this respect between European, European-bred girls and East Indian. Between 13 and 14 it is most common. It follows, therefore, that climate has less to do with this function than has been supposed, especially when we add, that instances occur in Bengal of native women having children at 50 and 60. Twins were born as late in life as 58 years in one instance, and 65 in another. In the last case, however, the mother died.

"I believe that even the fact of the existence of this function having been well established, is no proof of the girl being fit to become a mother, that is, to bear a living child. Almost the only instances I have known here, of instrumental labour in European bred females, were from their having married too young. Whilst if we look at the Europeans, Armenians, and Jews, among whom these childish marriages do not occur, we may infer that the Bengalee owes his physical inferiority less to the climate, than to this system of children begetting children. It was long ago asserted by SUSHRUTA, that such unions can only lead to imbecility. And long before him, the Greek sages and lawgivers had acted upon it as an established trut.'

The printed memoir, from which the above has been taken, as also the tables, I received direct by post from Calcutta, and it would seem to be part of a volume of Transactions now in course of publication. the first page in it being numbered 205. I feel myself under deep obligation to Professor Webb for having forwarded me so acceptable, I may say invaluable a present as his packet contained. The above extract is illustrated by several learned notes, which I have been compelled for want of space to exclude. For the same reason also I have had to omit a number of facts scattered through the memoir which would have illustrated my subject. As a specimen of these I may mention the account given of a preparation contained in the museum of the college showing the cause of death in a young Mahommedan female barely twelve years old, who died on the night of her nuptials owing to laceration of the perineum and a considerable portion of the vagina produced by violence inflicted in the consummation of the marriage.

*June 2*, 1845.

# PART III.

## MEDICAL INTELLIGENCE.

### PHYSIOLOGY.

*On the Composition of the Blood in a state of Health and of Disease.* By MM. **Becquerel** and **Rodier.** (*Journal de Pharmacie,* February 1845.)—These chemists first endeavoured to ascertain the exact composition of healthy blood in order that it might serve as a means of comparison, and, in their present researches, have endeavoured to ascertain how far the proportion of the different elements of that compound fluid are affected by sex and disease. Their researches were intended also to include the influence of age, constitution, and food; but their experiments are not sufficiently numerous to allow them to deduce any conclusions on these points.

As to sex, they found that in man the globules composed 141·1, the fibrin 2·2 in the 1000 parts of blood. In women the globules were in the proportion of 127·2, and the fibrin 2·2 in the 1000 parts. The density of the blood of women was also less than that of man—a circumstance explained by its containing a lesser proportion of solid ingredients. Before the establishment of the menstrual discharge in women, it was found that the proportion of globules in the blood was below the mean of 127 in the 1000 parts; that, during the menstrual period, the proportion varied from 127 to 137; but that, after the critical period of life, the proportion again fell below the 127. These experiments, therefore, accord in their results with those of MM. Andral and Gavarret on the exhalation of carbonic acid from the lungs at different periods of life.

As to disease, it was found that it produced marked changes on the composition of the blood, altering the proportion of all its constituents. Pregnancy was found to increase the proportion of globules, and to a small extent of the fibrin also. Repeated blood-lettings were found to diminish the proportion of globules, but not of the fibrin. A state of plethora was not found to increase the proportion of the globules. In the phlegmasiæ, the cholesterine and the fibrin were augmented, the albumen diminished. In fevers, the fibrin either remained at its normal standard or was diminished. In phthisis the elements of the blood were little changed; however the globules were found to have lost more or less of their weight, and the saponifiable fats were found diminished to a greater extent than in any other disease. In icterus, the quantity of cholesterine in the blood was notably increased, as well as the other saponifiable matters of the bile. In fine, the proportion of albumen was found materially diminished in Bright's disease of the kidney, and in certain diseases of the heart attended with dropsical symptoms.

*On the Digestion and Assimilation of Saccharine and Amylaceous substances.* By M. **Mialhe.** (*Comptes Rendus des Seances de l'Academie des Sciences,* 31st March 1845.)—It is now commonly believed that the alimentation of animals is effected by means of three different classes of substances, the azotised or albuminous, the fatty, and the saccharine. The researches of late experimentalists have proved that the digestion of the first is effected chiefly through the agency of the gastric juice, and that of the second by means of the bile; but nothing certain was determined relative to the saccharine or amylaceous group of substances. M. Mialhe, in a paper on diabetes, presented to the Academy of Sciences in April 1844, gave the first sketch of his views on the digestion of these substances, and in the present paper enters into the details. He found that the active matter in the digestion of amylaceous and saccharine matters was the saliva, and by operating on it, discovered its active principle to consist of a peculiar matter perfectly similar in properties and composition to diastase. This active principle of the saliva, which he proposes to name animal diastase, or salivaire, is a white or grayish white amorphous solid, insoluble in alcohol, but soluble in weak alcohol or in water. Its aqueous solution is insipid to the taste, and has a neutral action on test papers. It is not precipitated by the subacetate of lead; when left to itself it speedily decomposes and becomes acid. The acid which results is the butyric, or one very closely allied to it. This substance exerts no action on azotised substances, as fibrin, albumen, casein, gelatin or gluten, nor on the neutral ternary compounds, cane sugar, inuline, gum-arabic, and lignin. It exercises, however, a most remarkable action on amylaceous substances, as the following experiments will demonstrate.

When some of this active principle of the saliva is mixed with some starch beat up with six or eight times its weight of water, and the whole heated, the mixture never acquires a gelatinous consistence as plain starch would have done, but each grain of fecula is rendered entirely soluble the moment it becomes hydrated. After a little while the solution is not even coloured by means of iodine, but caustic potass, if heated with it, produces the intense brown coloration which indicates the conversion of the starch into dextrine and glucose. These substances are easily separated by treating the liquor with five or six times its weight of absolute alcohol, when the glucose is dissolved and the dextrine precipitated.

Raw starch takes a longer time to be acted on by the animal diastase, but its action is greatly increased by heat. The activity of this principle is such, that one part suffices to liquify and convert into dextrine and sugar more than 2000 parts of fecula.

M. Mialhe relates in his paper the comparative experiments he made with the diastase procured from germinating barley, from which it appears that its action on starch was identically the same. M. Mialhe concludes that all hydrocarbonaceous substances serving for aliment, can only undergo the process of assimilation provided they are decomposable by the weak alkaline solutions contained in the animal humours. This is done immediately in the case of glucose, dextrine, and sugar of milk, and mediately in the case of cane sugar and starch, which must first assume the form of glucose and dextrin. Those hydrocarbonaceous substances, on the other hand, which are neither fermentable nor decomposable by weak acid or alkaline humours, as lignin and mannite, do not undergo in man the digestive or assimilative process.

## MEDICAL POLICE.

*A Bill (as amended by the Committee) for Regulating the Profession of Physic and Surgery* [N.B.—*The clauses marked* (A.) *to* (E.) *were added by the Committee.*]—*Preamble.*—Whereas the laws now in force concerning the profession of physic and surgery require to be amended; be it enacted, by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same.

1. *Repeal of statutes.*—That an Act passed in the third year of the reign of King Henry the Eighth, intituled, "An Act for the appointing of Physicians and Surgeons;" and also another Act passed in the fifth year of the same reign, intituled, "An Act concerning Surgeons to be discharged of quests and other things;" and also two Acts passed in the thirty-second

year of the same reign, respectively intituled, "For Physicians and their privilege," and "for Barbers and Surgeons;" and also another Act passed in the Session of Parliament holden in the thirty-third and thirty-fourth years of the same reign, intituled, "A Bill that persons being no common Surgeons may minister medicines, notwithstanding the statute;" and another Act past in the first year of the reign of Queen Mary, intituled, "An Act touching the Corporation of Physicians in London;" and also an Act passed in the Session of Parliament holden in the sixth and seventh years of the reign of King William the Third, intituled, "An Act for exempting Apothecaries from serving the offices of Constable, Scavenger, and other parish and ward offices, and from serving on Juries;" and so much of every other Act as continues the last-recited Act; and so much of an Act passed in the eighteenth year of the reign of King George the Second, intituled, "An Act for making the Surgeons of London and the Barbers of London two separate and distinct corporations," as does not relate to the separation of the said corporations, or to the master, governors, and commonalty of the mystery of barbers of London; and also so much of an Act of the Parliament of Ireland passed in the fortieth year of the reign of King George the Third, for establishing a complete school of physic in Ireland, as may be construed to prevent the separation of the professorship of anatomy and chirurgery into two professorships, and the establishment of a professor of surgery and a professor of anatomy, to be severally maintained by the University of Dublin, instead of the professor of anatomy and chirurgery as provided by the said Act, or as imposes any restriction on the place where the lectures of the university professors of anatomy and chirurgery, chemistry, and botany; and also the whole of an Act passed in the fifty-fifth year of the reign of King George the Third, intituled, "An Act for better regulating the Practice of Apothecaries throughout England and Wales," except so much of the last-recited Act as confirms such parts of the letters patent granted by King James the First to the master, wardens, and society of the art and mystery of apothecaries of the city of London, as were not repealed by the last-recited Act; and also so much of an Act passed in the sixth year of the reign of King George the Fourth, intituled, "An Act for consolidating and amending the Laws relative to Jurors and Juries," as enacts, that all members and licentiates of the Royal College of Physicians in London actually practising; all surgeons being members of the Royal Colleges of Surgeons in London, Edinburgh, or Dublin, and actually practising; all apothecaries certified by the Court of Examiners of the Apothecaries' Company, and actually practising, shall be freed and exempt from being returned, and from serving upon any juries or inquests whatsoever, and shall not be inserted in the lists to be prepared by virtue of that Act, shall be repealed; but not so as to revive any Act or charter, or part of any Act or charter, repealed by the Acts hereby repealed, or any of them.

2. *Council of Health.*—And be it enacted, that a council shall be established, which shall be styled "The Council of Health;" and that one of Her Majesty's principal Secretaries of State shall be a member of the said council, in right of his office as Secretary of State; and that the regius professor of medicine in the University of Oxford, the regius professor of physic in the University of Cambridge, the regius professor of physic in the University of Dublin, the regius professor of clinical surgery in the University of Edinburgh, and the regius professor of surgery in the University of Glasgow, shall be members of the said council in right of their several professorships; and that the other members of the said council shall be a member of the senate of the University of London, to be chosen by the said senate; one physician and one surgeon to be chosen by the Colleges of Physicians and Surgeons of England respectively; one physician and one surgeon to be chosen by the Colleges of Physicians and Sur-

geons of Scotland respectively; one physician and one surgeon to be chosen by the Colleges of Physicians and Surgeons of Ireland respectively; two general practitioners to be chosen by the council of the College of general practitioners in medicine, surgery, and midwifery of England; and four other persons whom Her Majesty, with the advice of her privy council, shall deem fit to be members of the said council.

3. *Appointment of first council.*—Provided always, and be it enacted, that it shall be lawful for Her Majesty, with the advice of her privy council, to appoint all the members of the first council of health, other than those who will be members thereof in right of their several offices; and that at the end of the third and each of the two next following years after the first constitution of the said council, one physician and one surgeon of those first appointed on behalf of the said several colleges of physicians and surgeons, shall go out of office, in such order as Her Majesty, with the advice of Her privy council, shall direct; and that at the end of the third year after the first constitution of the said council, the member chosen on behalf of the University of London, and the two general practitioners chosen on behalf of the said college of general practitioners in medicine, surgery, and midwifery of England, shall go out of office.

4. *Tenure of office by official members and nominees of the crown.*—And be it enacted, that those members of the said council who are members in right of their several offices shall continue to be members thereof so long as they hold the same offices respectively, and no longer, and the four members of the said council, appointed as aforesaid by Her Majesty, with the advice of Her privy council, shall continue to be members of the said council during her Majesty's pleasure, and upon every vacancy among the last-mentioned members of the said council, and their successors, it shall be lawful for Her Majesty, with the advice of Her privy council, to appoint another fit person to be a member of the said council during Her Majesty's pleasure.

5. *Tenure of office by members chosen by the colleges.*—And be it enacted, that upon every vacancy among the members of the said council appointed on behalf of the said several colleges of physicians or surgeons, and their successors, the Royal College of Physicians or Surgeons of England, Scotland, or Ireland, as the case may be, shall choose another physician or surgeon, as the case may be, to supply such vacancy, subject to the approval of Her Majesty; and upon every vacancy made in the said council by the member chosen on behalf of the University of London, the senate of the said university shall choose another member of the senate of the same university to supply such vacancy, subject to the approval of Her Majesty; and upon every vacancy among the members of the said council appointed on behalf of the general practitioners of England, the council of the royal college of general practitioners in medicine, surgery, and midwifery of England, shall choose another general practitioner to supply such vacancy, subject to the approval of Her Majesty; and every member of the council so chosen shall be entitled to be a member of the said council for three years, and shall then go out of office, but may forthwith be re-chosen, subject to Her Majesty's approval: Provided always, that no president, vice-president, or examiner of any of the said colleges be qualified to act as a member of the said council while holding such office in any of the said colleges.

6. *Details of election to be settled by the several Colleges.*—And be it enacted, that the manner of choosing the last-mentioned members of the said council shall be determined in each case by orders or bye-laws to be made from time to time by the said several colleges, subject to the approval of the Council of Health.

7. *Substitutes in cases of extraordinary vacancies.*—And be it enacted, that it shall be lawful for any member of the said council appointed by

Her Majesty, or chosen by any of the said colleges, at any time to resign his office, or for Her Majesty at any time, with the advice of Her Privy Council, to dismiss any such member of the said council for notorious misbehaviour or unfitness, and upon any vacancy in the said council by death, resignation, or dismissal, another member of the council shall be appointed in the same manner and for the same term as the member by whom the vacancy shall have been made.

8. *Secretaries, clerks, and messengers.*—And be it enacted, that it shall be lawful for the said council, with the approval of one of Her Majesty's principal Secretaries of State, to appoint a principal secretary for the said council, and also local secretaries for Scotland and Ireland, and so many clerks and messengers, as the said Secretary of State shall deem necessary, and also with the like approval to remove at their pleasure any of the said secretaries, clerks, and messengers, and appoint others in their room.

9. *Salaries and expenses.*—And be it enacted, that there shall be paid to the members of the said council, and to the said secretaries, clerks, and messengers, such salaries as shall be from time to time allowed by the Lord High Treasurer or the Commissioners of Her Majesty's Treasury, who may also allow such reasonable travelling expenses which may have been incurred by any member of the said council, or any secretary, clerk, or messenger in the performance of his duties under this Act, and such other reasonable expenses of putting this Act into execution, as the said Lord High Treasurer or the Commissioners of Her Majesty's Treasury shall think fit.

10. *President.*—And be it enacted, that the said Secretary of State shall be president of the said council, and shall be empowered from time to time to nominate one of the members of the council to be vice-president of the council, and to act as president in his absence, and at every meeting of the council in the absence of the president and vice-president, some other member to be chosen by the council from the members then present shall be empowered to act as president.

11. *Time and place of meeting.*—And be it enacted, that the said council shall be holden in such places and at such times as the said council or the Secretary of State from time to time shall appoint; and that all acts of the council shall be decided by the votes of the majority of the members present at any meeting, the whole number not being less than seven; and at all such meetings the president for the time being shall have a second or casting vote in all cases of equality of votes.

12. *Minutes of proceedings.*—And be it enacted, that minutes of the proceedings at all meetings of the council shall be drawn up and fairly entered in books, to be kept for that purpose; and such minutes shall be at all reasonable times open to the inspection of any person or committee appointed for the purpose of inspecting them by any of the said universities or colleges.

13. *Register to be kept and published.*—And be it enacted, that a register shall be kept and published from time to time, under the direction of the said council, of all persons who shall have been examined, and shall have received, and shall exhibit before the said council letters testimonial as hereinafter mentioned of their qualification to practise as a physician, or as a surgeon, or as a general practitioner in medicine, surgery, and midwifery; for which registry the council shall be entitled to have from the person requiring to be registered a fee of L.5 in the case of a physician or surgeon, and a fee of L.2 in the case of a general practitioner, which fees shall be applied toward defraying the expenses of this Act; and every person whose name shall be so registered, who shall be desirous that his name shall be continued in the published register, shall in the month of September in every year send to the said council his name and place of abode, with the date of his testimonials, and the council shall verify the returns

so made to them by comparison with the register kept by them, and shall forthwith, without any further fee, cause the names of all persons duly registered and so returned to them to be published in alphabetical order in their several classes, with their several places of abode, and dates of their testimonials, specifying in each case the university or college to which each belongs; and a printed copy of the register for the time being, so published under the direction of the said council, shall be evidence in all courts, and before all justices and others, that the persons therein specified are registered as therein mentioned under this Act; and the absence of the name of any person from any class in such printed copy shall be evidence, until the contrary be made to appear, that such person is not registered in such class under this Act.

14. *General practitioners.*—And be it enacted, that every person shall be entitled to be registered by the council as a general practitioner, who at the time of the passing of this Act shall be legally practising or entitled to practise as a physician, surgeon, or apothecary in some part of Her Majesty's dominions, and who within twelve calendar months after the passing of this Act shall be qualified to be enrolled and shall enrol himself as a Fellow of the Royal College of General Practitioners in Medicine, Surgery, and Midwifery of England, or who shall have attained the age of twenty-two years, and shall have been examined by the colleges hereinafter named; (that is to say) if in England, examined by the Royal College of General Practitioners in Medicine, Surgery, and Midwifery of England; or if in Scotland, examined by the Royal Colleges of Physicians and Surgeons of Scotland; or if in Ireland, examined by the Royal Colleges of Physicians and Surgeons in Ireland, after such proof as shall be satisfactory to the examining college or colleges, that he has applied himself to medical and surgical studies during at least five years; and in every case shall have received letters testimonial from each of the bodies by which he shall have been examined, of his being duly qualified to practise as such general practitioner.

15. *Surgeons.*—And be it enacted, that every person shall be entitled to be registered by the council as a surgeon, who shall have attained the age of twenty-six years, and shall have been examined by one of the Royal Colleges of Surgeons of England, Scotland, or Ireland, after such proof as shall be satisfactory to the examining college that he has applied himself to surgical studies during at least five years; or that he has been registered as a general practitioner, or was at the time of the passing of this Act a member or licentiate of one of the said Colleges of Surgeons, and has been for twelve years in the practice of surgery, and in each case shall have received letters testimonial from the examining college of his being duly qualified to practise as a surgeon.

16. *Physicians.*—And be it enacted, that every person shall be entitled to be registered by the council as a physician who shall have attained the age of twenty-six years, and shall have graduated as a Bachelor or Doctor of Medicine in some university of the United Kingdom of Great Britain and Ireland, or, subject to the restriction hereinafter contained, in some foreign university, or shall have graduated as a Master of Arts in the University of Oxford or Cambridge, and shall have afterwards received a license to practise medicine, after due examination, from the same university, and shall also, in each of the foregoing cases, have been examined by one of the Royal Colleges of Physicians of England, Scotland, or Ireland, after such proof as shall be satisfactory to the examining college that he has applied himself to medical studies during at least five years, or who shall have attained the age of forty years, and shall have been registered as a general practitioner or surgeon under this Act, or was at the time of the passing of this Act legally practising or entitled to practise as a physician, surgeon, or apothecary in some part of the said united kingdom, and shall

have practised medicine for at least twelve years, and shall have been examined by the Royal College of Physicians of England; and in each case shall have received letters testimonial from the examining college of his being duly qualified to practise as a physician; and no person shall be entitled to be received for examination for the purpose of being so registered as a physician upon a foreign degree in medicine, unless the Royal College of Physicians of England, Scotland, or Ireland shall give him a special certificate, to be laid before and approved by the Council of Health, that they have made inquiry into the manner in which such degree was conferred, and have ascertained that it has been granted after due examination and upon satisfactory certificates of previous study, including residence and study at the seat of one or more universities, during at least three years, one of them at least being at the university by which the degree is granted.

17. *Clause* (*A.*) *Preliminary examination before Medical and Surgical Board.*—Provided always, and be it enacted, that a joint Medical and Surgical Board of Examiners shall be established in England, consisting of six physicians, to be chosen from time to time by the council of the Royal College of Physicians of England, and six surgeons, to be chosen from time to time by the council of the Royal College of Surgeons of England, who shall severally hold their appointments during the pleasure of the council by which they shall have been severally chosen, and that no person shall be qualified to offer himself for examination by the Royal College of Physicians of England for the purpose of being registered as a physician, or by the Royal College of Surgeons of England for the purpose of being registered as a surgeon, or by the Royal College of General Practitioners in Medicine, Surgery, and Midwifery of England, for the purpose of being registered as a general practitioner, until he shall have been examined, under the direction of the Council of Health, by the said Medical and Surgical Board, and shall be by them admitted to offer himself for such further examination by the examiners of the college to which he desires to belong; and the fee for such previous examination shall be such sum as shall be from time to time fixed by the Council of Health, not exceeding L.2; and the said fees shall be equally divided between the said colleges, who shall be empowered to make thereout such fixed allowances to the examiners as to them severally shall seem fit, subject to the approval of the Council of Health.

18. *Clause* (*B.*) *Provision for existing students.*—Provided always, and be it enacted, that it shall be lawful for the Council of Health to make regulations for dispensing with such provisions of this Act as to them shall seem fit, in favour of medical and surgical students who shall have commenced their professional studies before the passing of this Act.

19. *Physicians and surgeons to belong to a college of the country in which they practise.*—And be it enacted, that every person registered as a physician or surgeon under this Act (except those for whose registration in a supplemental register special provision is hereinafter made), shall be required to enrol himself as an Associate of the Royal College of Physicians, or as a Fellow of the Royal College of Surgeons from which he shall have received his letters testimonial as physician or surgeon; and every such physician and surgeon who shall afterwards remove from that part of the united kingdom in which he obtained his letters testimonial, shall be required, if he shall practise as a physician or surgeon in any other part of the said united kingdom, to enrol himself as an Associate of the Royal College of Physicians, or as a Fellow of the Royal College of Surgeons, of that part of the united kingdom to which he shall so remove, for the purpose of practising there, according to the nature of his testimonials, and in each case shall be entitled to be so admitted and enrolled without further examination, and on payment of the like fees of admission, and on complying with the same conditions as are required of other persons who

have passed their examinations and paid their examination fees for the purpose of being admitted associates or fellows of the said colleges respectively; and every physician or surgeon who, upon such removal, shall fail so to enrol himself, shall be struck off the register, and shall not be restored until he shall have so enrolled himself, and shall have paid such penalty for his default as to the Council of Health shall seem fit, not exceeding L.5 for each calendar month during which he shall have been so in default, and all such penalties shall be applied toward defraying the expenses of this Act; and for this purpose the fees of examination and fees of enrolment shall be kept distinct by each of the said colleges.

20. *Licentiates to belong to a college of the country in which they practise.*—And be it enacted, that every person registered in England as a general practitioner shall be required to enrol himself as a Fellow of the Royal College of General Practitioners in Medicine, Surgery, and Midwifery of England; and every person registered in Scotland or Ireland as a general practitioner shall be required to enrol himself as a Licentiate of the Royal College of Surgeons in that part of the united kingdom in which he shall have received his letters testimonial; and every such person who shall afterwards remove into any part of the united kingdom, other than that in which he obtained his letters testimonial, and shall practise there as a general practitioner, shall be required to enrol himself as a fellow or licentiate, as the case may be, of the college of which he would have been admitted a fellow or licentiate, if he had received his letters testimonial there, and in each case shall be entitled to be so admitted and enrolled without further examination, and on payment of the like fees of admission, and on complying with the same conditions as are required of other persons who have passed their examinations and paid their examination-fees for the purpose of being admitted fellows or licentiates of the said colleges respectively; and for this purpose the fees of examination and fees of admission shall be kept distinct by each of the said colleges; and every general practitioner who upon such removal shall fail so to enrol himself shall be struck off the register, and shall not be restored until he shall have so enrolled himself, and shall have paid such penalty for his default as to the Council of Health shall seem fit, not exceeding L.5 for each calendar month during which he shall have been so in default; and all such penalties shall be applied toward defraying the expenses of this Act.

21. *Qualifications and fees.*—And be it enacted, that the said several colleges shall, from time to time, when required by the Council of Health, prepare and lay before the said council a scheme or schemes of the course of study and particulars of the examination to be gone through by all persons applying to such colleges respectively for letters testimonial as physician, or surgeon, or general practitioner, and of the fees to be taken by the said several colleges respectively; and the said council shall be empowered to make from time to time such changes in any of the schemes so laid before them as to the said council shall seem expedient; and the said council shall endeavour to procure, as far as is practicable and convenient, that the qualifications and fees for the said testimonials shall be uniform, according to the nature thereof, throughout the said united kingdom: Provided always, that no change shall be made by the said council in any scheme of the course of study or particulars of examination, unless notice shall have been given at a previous meeting of the council, holden not less than fourteen days before the meeting at which the motion for such change shall be made, that at such meeting the course of study or particulars of examination, as the case may be, will be taken into consideration; and the principal secretary of the Council shall forthwith send a copy of the notice so given to every member of the Council.

22. *Restrictions on Medical Degrees.*—And be it enacted, that after the passing of this Act it shall not be lawful for any university of the said

united kingdom to confer any degree in the faculty of medicine, except by special license of the Council of Health, upon any person, unless he shall have been matriculated in the same university, and shall have duly attended the courses of public lectures prescribed by the same university to students in medicine, and delivered by duly authorised professors, at the seat of the same university, or, in the case of the University of London, at some medical school recognised by and in connection with that university, within five miles of Somerset House, in the parish of St Mary-le-Strand, in the city of Westminster, during at least two years after he shall have been matriculated in the same university, and shall have been examined at some time before the grant of such degree by the proper examiners of such university, and found by them to possess competent skill and knowledge of medicine, and of the sciences connected therewith; and every diploma or certificate of a medical degree granted by any such university, after the passing of this Act, shall set forth distinctly the time which has elapsed since the matriculation of the person to whom such degree shall be granted, and the time during which, and place where he shall have actually studied as aforesaid, and the fact that he has passed such examination as last aforesaid.

23. *Licentiates in the Faculty of Medicine.*—And be it enacted, that it shall be lawful for any university of the said united kingdom to grant the degree of licentiate in the faculty of medicine, subject to the restrictions hereinbefore contained concerning medical degrees, to any student of the same university who shall have attained the age of twenty-two years, and shall have applied himself to medical and surgical studies during at least five years; and that every such licentiate in the faculty of medicine, being also examined and having received letters testimonial of his qualification in the manner hereinbefore prescribed in the case of general practitioners, shall be entitled to be registered by the said Council of Health as a licentiate in the faculty of medicine, with all the rights, privileges, and liabilities of a general practitioner, subject to such general regulations as shall be made by the said Council concerning the registry of general practitioners.

24. *Restriction on Bye-laws.*—And be it enacted, that no bye-law to be made by any of the Royal Colleges of Physicians or Surgeons of England, Scotland, or Ireland respectively, or by the Royal College of General Practitioners in Medicine, Surgery, and Midwifery of England, shall be of any force until a copy thereof, sealed with the seal of the same college, shall have been laid before and approved by the said Council of Health.

25. *Registry of Students.*—And be it enacted, that it shall be lawful for the said council to make regulations for ensuring that in every city and town possessing a medical or surgical school, an annual register shall be kept of all students of the several medical and surgical schools, whether connected with any university, royal college, hospital, or other public medical or surgical institution in that city or town, and to authorise the taking of a fee for such registration, not being more in each case than 2s. 6d. for each annual registration, and for requiring all such fees to be remitted to the secretary of the said council, and returns to be made to them of the registration of all such students, in such manner and form as the council shall think fit, and all such fees shall be applied toward the expenses of this Act; and no medical or surgical student shall be admitted to examination by any of the said colleges without certificates of his having been duly registered conformably to such regulations.

26. *Constitution of the examining bodies.*—And be it enacted, that where by this Act it is provided that the concurrence of more than one body is required for qualifying any person to be registered by the said council, the examination before such bodies for his degree or letters testimonial, or both, may be conducted either separately before examiners appointed by each

body, or, subject to the approval of the council of health, and so long only as such approval shall be continued, before a joint board of examiners, to be appointed by each body separately or conjointly, and the examiners shall be appointed in such number, manner, and form, and shall hold their examinations at such times and places as such bodies shall, with the approval of the said council, agree from time to time among themselves, or as shall be determined by the said council with respect to any point in which they shall not be agreed; and where there shall be separate examinations on different subjects before examiners appointed by each body, the subjects and fees of examination shall be divided among such bodies as they shall from time to time agree among themselves, or as the said council from time to time shall determine with respect to any point on which they shall not be agreed.

27. *For securing efficiency of examination.*—And be it enacted, that the council of health may from time to time require returns to be made in such form, and including such particulars as they shall think fit, respecting the examinations to be conducted as aforesaid, and it shall be lawful for any member of the said medical and surgical board, deputed by the council for that purpose, or for any member or secretary of the said council, being in either case a physician, surgeon, or general practitioner, to be present at any of the said examinations, and report to the said council; and if the council shall, upon such report or otherwise, be of opinion that the regulations prescribed by them for the examination and grant of letters testimonial as physician, surgeon, or general practitioner, have been infringed, evaded, or neglected by any of the said examining bodies, it shall be lawful for the said council to refuse to register upon the testimonials of the body so in default, until the same be amended to the satisfaction of the said council.

28. *None but those registered to be appointed to public situations.*—And be it enacted, that, subject to the reservations hereinafter contained, no person after the passing of this Act who is not registered by the said council shall be appointed to any medical or surgical office in any hospital, prison, infirmary, dispensary, school, workhouse, or other public institution in the said united kingdom, or for the relief of the poor, or to any medical or surgical office in Her Majesty's army or navy, or in the service of the Honourable East India Company, except in India, natives of India duly qualified according to such laws or regulations as are or shall be made in that behalf by the governor-general in council; and wherever by law it is provided that any act shall be done by a physician or surgeon, or medical or surgical practitioner, by whatever name or title called, such provision shall be construed, after the passing of this Act, to mean a person qualified to be appointed to such medical or surgical offices as aforesaid; and the council of health shall be empowered from time to time to make regulations for specifying what institutions are to be considered public institutions within the meaning of this Act.

29. *Privileges of persons registered.*—And be it enacted, that all persons who shall be registered by the said council as physicians, surgeons, or general practitioners, shall be exempt while registered and practising as such from being summoned or serving on all juries and inquests whatsoever, and from serving all corporate, parochial, ward, hundred, and township offices, but subject to the reservations hereinafter contained, no person shall be entitled to such exemption, on the ground of his practising medicine or surgery, who is not so registered, nor shall the certificate of any such unregistered person, given after the passing of this Act, be received as the certificate of a medical or surgical practitioner in any court of law, or in any case in which by law the certificate of a medical or surgical practitioner is required.

30. *Registered Physicians may practise throughout the United King-*

*dom.*— And be it enacted, that all persons who shall be registered by the said council as physicians shall be entitled without other license than such registry to exercise or practise physic throughout the united kingdom of Great Britain and Ireland, and in all other parts of Her Majesty's dominions, and shall be deemed qualified to be appointed physicians to any public or local institution therein, and shall be exempt from being sued or liable to any penalty under the provisions of an Act passed in the Session of Parliament holden in the fourteenth and fifteenth years of the reign of King Henry the Eighth, intituled, " the Privileges and Authority of Physicians in London," or under the provisions of any other Act of Parliament passed or charter granted before the passing of this Act in restraint of the practice of physic or the appointment of physicians in any place, or to any office without such examination, certificate, license, or qualification, as is mentioned in such Act or Charter respectively.

31. *Clause* (C.) *Registered Surgeons may practise throughout the United Kingdom.*—And be it enacted, that all persons who shall be registered by the said Council as surgeons shall be entitled, without other license than such registry, to exercise or practice surgery throughout the United Kingdom of Great Britain and Ireland, and in all other parts of Her Majesty's dominions, and shall be deemed qualified to be appointed surgeons to any public or local institution therein, and shall be exempt from being sued or liable to any penalty under the provisions of the said Act passed in the Session of Parliament holden in the fourteenth and fifteenth years of the reign of King Henry the Eighth, or under the provisions of any other Act of Parliament granted before the passing of this Act, in restraint of the practice of surgery, or the appointment of surgeons in any place or to any office, without such examination, certificate, license, or qualification as is mentioned in such Act or Charter respectively.

32. *Registered general practitioners qualified to charge for medicines and attendance, and to fill medical and surgical offices.*—And be it enacted, that all persons who shall be registered as general practitioners by the said Council shall be entitled to demand and take reasonable fees for medical and surgical advice and attendance, and for medicines prescribed or administered by them to their patients throughout Great Britain and Ireland, and in all other parts of Her Majesty's dominions, without other license than such registry, and shall be exempt from being sued or liable to any penalty under the provisions of any Act of Parliament passed or charter granted before the passing of this Act, in restraint of the practice of medicine or surgery, or the appointment of medical or surgical practitioners, in any place or to any office, and shall be deemed qualified to be appointed medical or surgical attendants to any public or local institution in all parts of Her Majesty's dominions, without such examination, certificate, license, or qualification as is mentioned in such Act or charter respectively.

33. *Persons now practising may be registered in a supplemental register.*—Provided always, and be it enacted, that during twelve calendar months after the passing of this Act, every person legally practising or entitled to practise on the day before the passing of this Act as a physician, surgeon or apothecary in any part of the united kingdom of Great Britain and Ireland, and during the period of two years after the passing of this Act, every person legally practising or entitled to practise on the day before the passing of this Act as a physician, surgeon or apothecary in any of Her Majesty's Colonies and foreign possessions, although not registered, shall continue to enjoy the same privileges and exemptions, and be qualified to be appointed to the same offices, and to practise in the same manner as if this Act had not been passed, and no further or otherwise, unless registered under this Act; and the said Council, on the application at any time of any person legally practising or entitled to practise, on the day be-

fore the passing of this Act, as a physician, surgeon or apothecary in any part of the said united kingdom, shall cause the name of such person to be registered in a supplemental register as a physician, surgeon or apothecary, as the case may be, specifying the nature of his qualification, and whence derived, on production to the said Council of his diploma, license or certificate, or such other proof as shall be satisfactory to the said Council, that on the day before the passing of this Act he was so practising or legally entitled to practise, and on payment of a fee of 5s., which fees shall be applied toward the expenses of this Act; and every such person, upon being so registered, shall continue to enjoy the same privileges and exemptions, and be qualified to be appointed to the same offices, and to practise in the same manner as if this Act had not been passed, and no further or otherwise.

34. *None but registered general practitioners or those already practising may recover charges.*—And be it enacted, that after the passing of this Act, no person shall be entitled to recover any charge in any court of law for any medical or surgical advice, attendance, or operation, or for any medicine prescribed or administered by him, unless he shall prove upon the trial either that he is registered as a general practitioner under this Act, or that before the passing of this Act he was legally practising or entitled to practise in the capacity in which he claims such charge, and if this Act had not been passed would have been entitled to recover such charge in that capacity.

35. *Penalty on unqualified persons for practising in public offices.*—And be it enacted, that every person appointed after the passing of this Act to any medical or surgical office for which he is not qualified according to the provisions of this Act, and who shall wilfully and knowingly act or practise in such office, shall for every such offence forfeit the sum of L.20, to be recovered by action of debt or information to be brought in any of Her Majesty's Courts of Record at Westminster, or in the Court of Exchequer in Scotland, or in Dublin, within six calendar months next after the commission of the offence, in the name of Her Majesty's Attorney-General in England or Ireland, or of the Lord Advocate in Scotland.

36. *Clause (D.) Penalty on unqualified persons practising as apothecaries.*—And be it enacted, that every person who after the passing of this Act shall act or practise as an apothecary in any part of England or Wales, without having been registered by the said Council of Health as a general practitioner in medicine, surgery, and midwifery, shall for every such offence forfeit and pay the sum of L.20, to be applied to the use of the said college of general practitioners in medicine, surgery, and midwifery, and to be recovered by the said college by action of debt in any of Her Majesty's Courts of Record at Westminster.

37. *Clause* (E.) *Saving the right of qualified Apothecaries.*—Provided always, and be it enacted, that nothing in this Act contained shall extend to render any person liable to any penalty for acting or practising as an apothecary in any part of England or Wales, who was actually practising as an apothecary on the first day of August in the year 1815, or who before the passing of this Act shall have obtained a certificate of qualification to practise as an apothecary from the Court of Examiners of the Society of Apothecaries of the City of London, or who shall have acquired the right of practising as an apothecary by virtue of an Act passed in the sixth year of the reign of King George the Fourth, intituled "An Act to amend and explain an Act of the 55th year of his late Majesty, for better regulating the practice of apothecaries throughout England and Wales."

38. *Penalty for false pretences of qualification.*—And be it enacted, that none but persons registered as physicians shall use the title of Doctor, and that every unregistered person who shall wilfully and falsely pretend to be, or take or use the name or title of physician, doctor, bachelor or licentiate in the faculty of medicine, or surgeon, or general practitioner or

apothecary, or any name, title, or addition implying that he is registered under this Act, or recognised by law as a physician, or surgeon, or apothecary, or practitioner in medicine, surgery, or midwifery, and also every registered person who shall take or use any name or title belonging to a class in the registry to which he does not belong, or implying that he is a fellow or associate of any college to which he does not belong, shall be deemed guilty of a misdemeanour in England and Ireland, and in Scotland of a crime and offence, and being convicted thereof, shall be punished by fine or imprisonment, or both, as the court before which he shall be convicted shall award.

39. *Persons guilty of felony or fraud to be struck off the register.*—And be it enacted, that if any registered physician, surgeon, or general practitioner shall be convicted in England or Ireland of any felony, or in Scotland of any crime or offence inferring infamy, or the punishment of death or transportation; or if it shall be found by the judgment of any competent court that any such physician, surgeon, or general practitioner shall have procured the registry of his name by any fraud or false pretence, or that any such physician, surgeon, or general practitioner has wilfully and knowingly given any false certificate in any case in which by law the certificate of a physician or surgeon is required, it shall be lawful for the Council of Health, on production before them of a copy or extract of the conviction or judgment of the court duly certified, under the hand of the proper officer of the court, to cause the name of such physician, surgeon, or general practitioner to be erased from the register; and every person whose name shall have been so erased after such conviction or judgment as aforesaid, shall thereby forfeit and lose all the privileges of a registered physician, surgeon, or general practitioner, as the case may be, and shall not be entitled to have his name again inserted in that or any subsequent register, without the special license of the Council of Health, on the recommendation of the college of which he was a fellow, associate, or licentiate, and shall also cease to be, and shall be disqualified from becoming, while his name shall continue so erased, a fellow, associate, member, or licentiate, as the case may be, of any royal college of physicians, or surgeons, or general practitioners in any part of the said united kingdom.

40. *Saving the privileges of Oxford and Cambridge.*—Provided always, and be it enacted, that nothing in this act shall deprive either of the universities of Oxford and Cambridge of the unrestricted right of granting degrees in medicine or physic and diplomas thereof, and licenses to practise medicine or physic in conformity with their respective charters, statutes, laws, and regulations; and that the said degrees, diplomas, and licenses shall severally confer the same rights and privileges as heretofore, and that the persons to whom they shall be granted shall, in every part of England, not within the city of London, or within seven miles of the said city, possess all the privileges of physicians registered under this Act; and that nothing in this Act shall alter or give any power of altering the charters, statutes, laws, and regulations of the said universities of Oxford and Cambridge or either of them.

41. *Act may be amended or repealed.*—And be it enacted, that this Act may be amended or repealed by any Act to be passed in this session of Parliament.

*Statement of the Council of the Royal College of Surgeons of England, relative to certain parts of the "Bill for Regulating the Profession of Physic and Surgery," as amended in Committee on the 7th of May* 1845.—At a meeting of the Council of the Royal College of Surgeons of England, held on the 5th of June 1845, *Present,*—Sir Benjamin Brodie, Bart., *President,*—Mr Cooper, Mr Lawrence, *Vice-Presidents,*—Mr Keate, Mr Vincent, Mr Guthrie, Mr Andrews, Mr Briggs, Mr Travers, Mr Swan, Mr Stanley, Mr Green, Mr Callaway, Mr Liston, Mr Arnott, Mr South, Mr Welbank, Mr Cutler, the following statement, relative to certain parts of the "Bill for Regulating the Profession of Physic and Surgery" (as amended in Committee of the House of Commons on the 7th ultimo), was unanimously approved and adopted:—The Council of the Royal College of Surgeons of England, after considering the amended bill as fully as the difficulty of ascertaining the exact meaning of some of its provisions permits, beg leave to submit some observations, which, as offered by those whose duty it is to guard the interests of the surgical department of the profession, will not, they trust, be deemed unworthy of serious attention.

The Council respectfully represent that the new charter and bye-laws of the College of Surgeons were framed in conformity with the propositions submitted to them in the form of "Heads of a Bill for Regulating the Practice of Medicine and Surgery," and that they assented to the change which the charter effects in the constitution of the college, as an essential part of the measure then contemplated for the regulation of the medical profession. But they are prepared to show that the amendments, as proposed in the Committee of the House of Commons, differ in principle from the bill and from the original bill, of which the heads were submitted to this council, and that they are inconsistent with the charter and bye-laws founded upon those "heads."

The Council had every reason to believe that the change in the constitution of the college was a pledge of the continued support of Her Majesty's Government; but they find that one of the principal features of the amended bill is that of providing for the institution of a college of general practitioners in medicine, surgery, and midwifery. Now, although it was not unknown to the council of this college that the subject of incorporating the general practitioners was under consideration, they imagined that the object of the incorporation was to provide for the more efficient performance of the duties confided to the Society of Apothecaries; and they cannot help expressing their surprise that, without any official communication to those most affected by it, a new college is about to be established, which is intended not only to embrace medicine, surgery, and midwifery, but to be co-ordinate in professional rank and importance with the existing colleges of physicians and surgeons. It might be an invidious task for the council to investigate the probable results of a measure which will entirely change the relations of the several branches of the profession, and confound distinctions hitherto recognised as beneficial to the community; but they feel bound to state their deliberate conviction that in the framing of the amended bill, the interests and privileges of the College of Surgeons, and its claims to legislative protection, founded on the undeniable ground of public utility, have been unhappily overlooked.

That the proposed college is intended to be co-ordinate in professional rank and importance with the existing Colleges of Physicians and Surgeons will be seen by clause 14, in which the style of the new college is recited as the Royal College of General Practitioners in Medicine, Surgery, and Midwifery of England, and its members are described under the title of Fellows. Thus, for the first time, will every general practitioner be presented to the public under the title of Fellow—a title which was intended to designate the highest professional qualifications of physician or surgeon, but which here appears to imply that the general practitioner combines the highest qualifications of both physician and surgeon, conjoins their functions, and superadds those of the professor of midwifery, but discards the characteristic designation of apothecary. The Council believe that the proposed title of Fellow of the Royal College of General Practitioners does not intelligibly describe those who, combining the practice of medicine, surgery, and midwifery, with that of pharmacy, compound their medicines and supply medical aid and advice at a moderate cost; or, that it describes them under a title which can scarcely fail to mislead the public in estimating their true character.

In the absence of the draft of the charter to the proposed college, this Council have no means of forming an opinion as to the precise powers and privileges intended to be conferred on the new body, but they think enough appears on the face of the amended bill to show that it is proposed to establish a court of examiners, who are to have the exclusive power to grant letters testimonial of the fitness of persons to practise as general practitioners, and who will therefore, it may be presumed, examine the candidates in surgery.

It is true, indeed, that by clause 17 a provision is made for a preliminary examination to be conducted by a joint medical and surgical board, including six surgeons chosen by the Council of the College of Surgeons; but it is equally true that the candidate for the diploma which is to enable him to practise surgery at the age of twenty-two years, or at any later age, —unless he become a Fellow of the College of Surgeons,—will be subjected to a second examination, may be rejected, and can only obtain an authority to practise surgery through the Royal College of General Practitioners. It is plain, then, that, by the amended bill, the College of Surgeons will be subordinate to the College of General Practitioners in those functions for which the College of Surgeons was specially instituted, and that the surgical examiners at the joint boards may be placed in the degrading position of having a candidate whom they had declared duly qualified, rejected at the subsequent examination by general practitioners. It is also, to say the least, a singular feature of the amended bill, that the legally constituted court of examiners of the College of Surgeons should have been passed by, as wholly undeserving of notice, in arrangements which demand services for which they must be supposed peculiarly fitted. And it is worthy of remark, that the preliminary examination, which is not required in Scotland and Ireland, is made imperative on those who desire to become surgeons in England, and that those who have passed a single examination in Scotland or Ireland will be entitled to all the advantages of English practitioners, who have undergone a double examination.

It will be seen from clause 32 that registered general practitioners are to be deemed to all intents and purposes qualified practitioners of surgery, and capable of filling any surgical appointment, in any local or public institution. And, by comparing clause 15 with clause 14, we learn that the qualification being in each case the same, namely, five years of professional study, the general practitioner is to have the advantage of obtaining at twenty-two years of age the legal authority to practise surgery, which is withheld from the surgeon till he is twenty-six years of age. The probable result, therefore, of this part of the amended bill will be, that the object of the College of Surgeons—in instituting, with the concurrence of Her Majesty's Government, the fellowship of this college as a higher grade of members of the surgical profession, in order to excite a spirit of emulation and to promote a higher and more extended education—will be defeated, as far as legislation can accomplish it.

By clause 15, every registered general practitioner will be entitled to be registered as a surgeon, provided he has been twelve years in the practice of surgery, and shall have received letters testimonial from this college of his being duly qualified to practise as a surgeon. The Council of this college, therefore, cannot but think that the amended bill is calculated to discourage the attainment of the fellowship in the manner prescribed by the bye-laws of the college, which require a prolonged course of laborious studies; since, according to the provisions of this clause, the general practitioner is already completely a surgeon in all his functions, qualifications, and privileges. And they perceive that the operation of the above clause will be direct and certain in taking away all inducement to obtain the diploma of this college, and thus, in limiting its members to those who were designed by the charter to form only the higher grade of fellows.

Thus, under hostile attacks, devoid of any reasonable ground, and unsupported by any rational argument, is the Royal College of Surgeons—recently re-chartered by Her Majesty for the promotion and cultivation of surgical science, and not charged as unfaithful to, or incapable of its high functions—thus is the Royal College of Surgeons of England in danger of being sacrificed to the views and wishes of those who hope to annihilate it by the establishment of a rival college of surgeons under the specious name of a College of General Practitioners in Medicine, Surgery, and Midwifery. It will not, however, escape notice, that the proposed corporation, in assuming the name of a college, has no legitimate claim to a title, properly used to designate any institution, of which the essential object is the promotion of science and learning. In the case of physic and surgery, the claim is precluded by the existence of the Colleges of Physicians and Surgeons; and in that of midwifery and pharmacy, the cultivation of each would properly devolve upon a special institute, the intention of which should be guaranteed by the appointment, in the first instance, of the most distinguished professors of the science.

That sufficient reasons may exist for an incorporation of general practitioners, the council of the college are as little prepared now to deny as when in reply to the National Association of General Practitioners they said,—"With regard to the proposed incorporation of the general practitioners as a separate body or college, the council have as little the wish as the power to prevent them from obtaining a charter, and would offer no objection to the incorporation of a body for the performance of the functions hitherto executed by the Society of Apothecaries." The council of this college do not object to an incorporation of general practitioners, if it should be found necessary, in order to fulfil purposes of public utility which cannot be accomplished by the two existing colleges; but they protest solemnly and urgently against such incorporation in a form which, in assuming a name and powers to which it has no legitimate claim, invades and annuls functions vested in the Royal College of Surgeons.

Whether the separate incorporation of the general practitioners would best promote their own interests and the interests of the medical profession at large, is a question of doubtful solution. In considering that question, however, it is important to remember, that by the provisions of the recent charter and bye-laws, the union of the general practitioners with this college may be obtained by means which cannot fail to raise their qualifications. The fellow of the college who has obtained his degree at twenty-five years of age, after a liberal and extended education, will not be precluded from practising, in conjunction with surgery, the other branches of the profession; and a general practitioner, being a member of this college, who may have been deprived of the opportunity of obtaining his degree at twenty-five, may become a fellow after having been in practice for a definite number of years. And it may be added, that all the fellows, under the conditions of the charter, are eligible to the council and to the highest honours of the college.

In conclusion, the council, appealing to the estimation in which the diploma is held, and the high character which English surgery has attained, in proof that the rights and privileges conferred on the college by Royal Charter have been faithfully employed for the intended purpose of advancing the science of surgery, hope and trust that the services and claims of the institution will be fully considered before any legislative measure shall be adopted for the regulation of the medical profession; that no new institution will be authorised to assume a name implying functions hitherto entrusted to this college, nor be empowered to interfere with or supersede it in its legitimate province of testing the qualifications of surgeons, and conferring on them the legal authority to practise surgery.—By order of the Council, EDMUND BELFOUR, *Secretary.*

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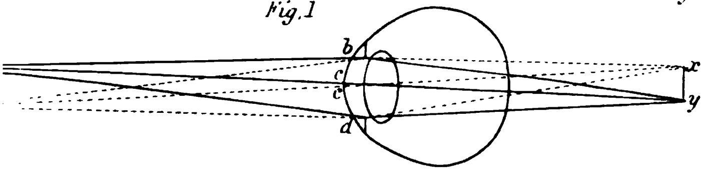
Fig. 1



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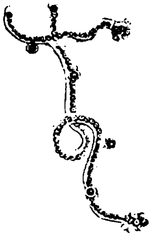

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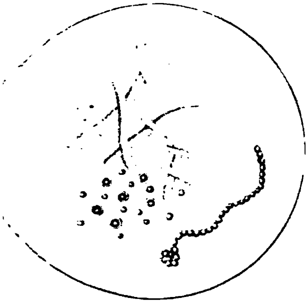

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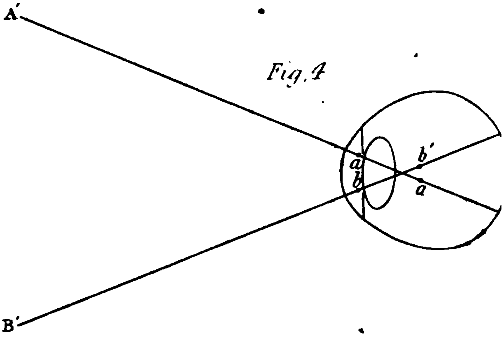

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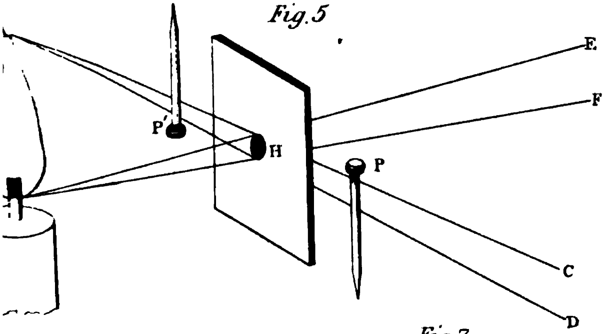

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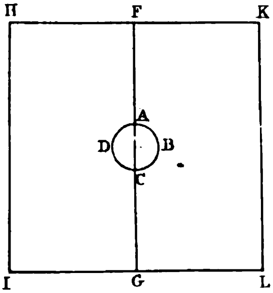

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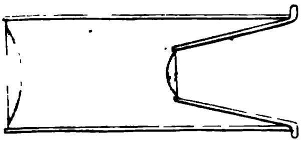

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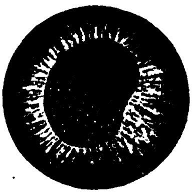

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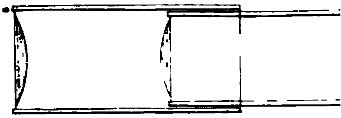

Geo. Aikman Sc.

THE

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## No. CLXV.

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### CORRIGENDA ET ERRATA.

Page 109, line 34, *delete* "blood-letting."
112, line 16, *delete* "only."
390, line 27, *for* "tumour," *read* "humour."
398, line 24, *for* "distended," *read* "displaced."
409, line 7 from foot, *for* "verisimilitude of," *read* "verisimilitude or."
413, line 37, *for* "Goodsir," *read* "Gendrin."
420, line 22, *for* "pressed," *read* "formed."

## NOTICES TO CORRESPONDENTS.

Communications have been received from Dr STRATTON, Mr T. SPENCER WELLS, Dr HOCKEN, Dr IRVING, and Dr PATERSON.

The following publications have been received:—

Outlines of Chemistry for the use of Students. By William Gregory, M. D., Professor of Chemistry in the University of Edinburgh. Part 2, Organic Chemistry. London, 1845. Pp. 588.

The Cold Water Cure, its use and misuse examined. By Herbert Mayo, M. D., F. R. S., formerly Surgeon of Middlesex Hospital, London. London, 1845. Pp. 85.

On Cataract, and its appropriate Treatment by the operation adapted for each peculiar case. By Charles Gardiner Guthrie, Assistant Surgeon to the Royal Westminster Ophthalmic Hospital. London, 1845. Pp. 127.

Practical Notes on Insanity. By John Burdett Steward, M.D., F.R.C.P. London, 1845. Pp. 122.

Chemistry, Meteorology, and the Function of Digestion, considered with reference to Natural Theology. By William Prout, M. D., F. R. S., &c. Being the Eighth of the Bridgewater Treatises on the Power, Wisdom, and Goodness of God. 3d Edition. London, 1845. Pp. 515.

The Retrospect of Practical Medicine and Surgery, being a half-yearly Journal containing a Retrospective View of every Discovery and Practical Improvement in the Medical Sciences. Edited by W. Braithwaite. Vol. xi. January to June 1845. London, 1845. Pp. 335.

The Irish Watering Places, their Climate, Scenery, and accommodations; including analyses of the Principal Mineral Springs by Dr R. Kane, &c. &c. By Alexander Knox, M. D. Dublin, 1845. Pp. 336.

Fruits and Farinacea the proper Food of Man. By John Smith. London, 1845. Pp. 422.

Some Observations on Organic Alterations of the Heart, and particularly on the beneficial employment of Iron in the treatment of such cases. By S. Scott Alison, M. D., Member of the Royal College of Physicians, London, &c. &c. London, 1845. Pp. 62.

A System of Surgery. By J. M. Chelius. Translated from the German by John F. South, Surgeon to St Thomas' Hospital. Parts iv. v. vi. London, 1845.

The Chemistry of Vegetable and Animal Physiology. By Dr G. J. Mulder, Professor of Chemistry in the University of Utrecht. Translated from the Dutch by Dr P. F. H. Fromberg, with an Introduction and Notes by J. F. W. Johnston, F. R. SS. L. & E. Part 2.

An Inquiry into the Physiological and Medicinal Properties of the *Aconitum Napellus*, &c. By Alexander Fleming, M. D. 8vo. London, 1845. Pp. 160.

The Transactions of the Provincial Medical and Surgical Association. instituted 1832. Vol. XIII. 8vo. London, 1845. Pp. 418, with Plates.

On Diseases of the Liver. By George Budd, M. D., F. R. S., Professor of Medicine in King's College, London, &c. 8vo. London, 1845. Pp. 401, and two coloured plates.

On Growth, or Health and Diseases of Youth. By A. M. Bureaud-Riofrey, M. D., Corresponding Member of the Imperial Academy of St Petersburg, &c. &c. 8vo. Paris and London, 1845. Pp. 163.

Rational Orthopedy, or the Treatment and Cure of Spinal Curvatures and other Deviations. By A. M. Bureaud-Riofrey, M. D. &c. &c. 8vo. London and Paris, 1845. Pp. 39.

The Nature and Treatment of Gout. By William Henry Robertson, M. D., Physician to the Buxton Bath Charity. 8vo. London, 1845. Pp. 372.

Medical and Physiological Problems, being chiefly Researches for Correct Principles of Treatment in Disputed Points of Practice. By William Griffin, M. D., Member of the Royal College of Surgeons, Edinburgh, and by Daniel Griffin, M. D., Member of the Royal College of Surgeons, London. London, 1845. 8vo. Pp. 558.

Glanders and Farcy in the Horse. By William Percival, M. R. C. S. Part 2d of Vol. III. of the author's Hippo-pathology. London, 1845. 8vo. Pp. 159.

A Treatise on the Diseases and Special Hygiene of Females. By Colombat de L'Isere. Translated from the French with Additions. By Charles D. Meigs, M. D. Philadelphia, 1845. 8vo. Pp. 718.

The Pharmaceutical Latin Grammar; being an Easy Introduction to Medical Latin, the London Pharmacopœia, and the perusal of Physicians' Prescriptions. By Arnold James Cooley. London, 1845. 12mo. Pp. 132.

A Practical Treatise on Inflammation, Ulceration, and Induration of the Neck of the Uterus. By James Henry Bennet, M. D., Licentiate of the Royal College of Physicians, &c. London, 1845. Post 8vo. Pp. 212.

The Curative Influence of the Climate of Pau, and the Mineral Waters of the Pyrenees, on Disease, with Descriptive Notices of the Geology, &c. and Topography of the Pyrenees, &c. By Alexander Taylor, M. D., Edinburgh. London, 1845. 8vo. Pp. 342.

The Ocean Flower; a Poem, preceded by an Historical and Descriptive Account of the Island of Madeira. By T. M. Hughes. London, 1845. 12mo. Pp. 309

Dictionary of Practical Medicine. Part X. 8vo. By James Copeland, M. D. &c.

The Medico-Chirurgical Review, and Journal of Practical Medicine. Edited by James Johnson, M. D., &c. New Series, V. No. 85. June 1845.

The British and Foreign Medical Review and Quarterly Journal of Practical Medicine and Surgery. Edited by John Forbes, M. D., &c. No. XXXIX. June 1845.

The London Medical Gazette, Session 1844. London, 1845. New Series, No. 7, 14th June 1845. No. 20. 12th September 1845.

The Northern Journal of Medicine, &c. Edited by William Seller, M. D., &c. Nos. XV. XVI. XVII. July, Aug. Sept. 1845.

The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D., &c. No. XIX. New Series. July 1845. Philadelphia, London, Paris.

The Medical Examiner and Record of Medical Science. Edited by Robert M. Huston, M. D., &c., Philadelphia. New Series. No. VI. June, No. VII. July, No. VIII. August 1845.

The New York Journal of Medicine and the Collateral Sciences. Edited by Charles A. Lee, M. D. No. XIII. July 1845. New York.

The American Journal of Insanity. Edited by the Officers of the New York State Lunatic Asylum, Utica. April 1845. No. IV. Vol. I., and No. I. Vol. II. July 1845. Utica.

Annual Report of the Managers of the State Lunatic Asylum, made to the Legislature, January 18, 1844. Albany, 1844. 8vo. Pp. 66.

Transactions of the New York State Medical Society. Vol. VI., Part i. Albany. 8vo. Pp. 78.

Fifty-Eighth Annual Report of the Regents of the University of the State of New York, made to the Legislature, March 1, 1845. Albany, 1845. 8vo. Pp. 290.

Weekly Tables of Mortality for the Metropolis. No. XXIV. Saturday, 14th June, No. XXXVI., Saturday, 6th September 1845.

Provincial Medical and Surgical Journal. Edited by Robert J. N. Streeten, M. D. No. XXV., Wednesday, 18th June 1845. No. XXXVIII. Wednesday, 17th September.

THE

# EDINBURGH
# MEDICAL AND SURGICAL JOURNAL.

1. OCTOBER 1845.

## PART I.

### ORIGINAL COMMUNICATIONS.

### ART. I.—*Report of Cases, &c. brought before the Liverpool Pathological Society, Session 1844–45, which were illustrated by Pathological Specimens, Drawings, Casts, &c. With the Secretary's Address.*

*Address by the Secretary*, THOMAS INMAN, M. D. London, Senior Honorary Surgeon to the Liverpool Fever Hospital and Work-house Infirmary.

MR PRESIDENT AND GENTLEMEN,—In accordance with the twelfth rule of our Society, I beg to lay before you the following summary.

We have great reason for congratulation in the number of interesting cases brought under our notice, in the amount of valuable information elicited by debate, as well as in the continued support given to the main objects of the society, by the regular and full attendance of its members.

In laying before you a succinct account of our proceedings, I shall be compelled to omit many points well worthy of insertion, as I am desirous of not trespassing on your time longer than is necessary to draw an outline of the subjects as they occurred.

At our first meeting this session, a case was detailed, in which three spiculæ of bone had been driven into the brain of a child eighteen months old, where they remained for four months, without producing any symptoms, and whence they were at length expelled, being driven forwards, as it were, by the growth of granulations behind them. Although the brain was exposed and covered with a superficial slough during a great part of this time, the bodily health of the child remained unimpaired, and the recovery was complete.

A case of splenitis, caused by malarious poison on the coast of Africa, has been detailed, the chief interest of which, independent of the pathological appearances, was the fact, that the patient had never suffered from fever of any kind. In this as in other instances where the spleen has been enlarged and its functions impaired, the skin had a remarkably sallow tint.

A coloured drawing, representing the appearance of medullary deposits in the lung, has been exhibited, taken from a patient who died with a large tumour (medullary sarcoma) on one shoulder, and complete metamorphosis of the opposite lung into the same structure.

Two specimens of urine, coloured by the action of sulphuretted hydrogen, have been shown, taken from a woman who had been using large quantities of mercury without any effects upon the gums. One that had been tested while she was taking the mineral showed an intensely black deposit. The other tested ten days after was much less dense, and stood six hours before the effects of the reagent were perceptible.

At the same time a specimen was presented to the museum, of a most remarkable and curious form of internal strangulation, produced by the ileum encircling the sigmoid flexure of the colon in such a manner as to produce the first tie of a knot. This gave rise to a discussion upon the propriety of recommending an operation, where the evidence of internal strangulation was conclusive; the majority considering it as unjustifiable, more especially as in the case before us, such was the character of the obstruction that it could not be discovered on the dead subject till after minute examination.

A rectum and colon have been presented to our notice, from which proceeded a number of appendices, appearing externally like fibrous tumours, hanging by small pedicles, but which, on slitting up the gut, were found to be herniæ of the mucous membrane through the muscular coat, each being filled with fæcal matter. It was not known whether the patient had been subject to constipation.

A fatal case of hemorrhage from the intestinal mucous membrane has been detailed, affording conclusive evidence that an effusion of blood sufficient to destroy life may occur without any solution of continuity.

A rare preparation of hemorrhage into the *Pons Varolii* has been presented to our museum, the value of which has been greatly enhanced by the full history of the case being given with it.

A case of partial softening of the *Pons Varolii* occurring in a robust young man who had previously suffered from painters' colic, has been detailed,—a great point of interest being the existence of lead in the cerebellum, in quantity sufficient to make a very evident deposit upon zinc wire.

An instance of inflammatory softening of the spinal chord, the result of external violence, has been recorded, which was remarkable for the rapidity of its progress and the circumscribed character of the disease—no marks of inflammation being perceptible in any of the meninges.

Two cases of tumours attached to nerves have been related, one occurring near the knee joint, where, after four years of aggravated suffering, a nervous filament was cut through, and a tumour the size of a small pea removed. The other was situated in the neck, in close connection with three nerves of the brachial plexus, and on being pressed between the fingers, or cut into, produced great pain, leading one to infer that it was absolutely composed of neurine.

We have, during the present session, been greatly favoured with the inspection of an uterus, taken from a woman who died of pneumonia at the eighth month of pregnancy, containing the fœtus and its appendages entire, as well as with the examination of others after abortion at various periods.

A large polypus, of a fibrous character, has been shown, which had been expelled from the uterus by contractions produced by the ergot of rye,—the case being recorded at great length in the Provincial Medical and Surgical Journal.

An instance of ovarian dropsy proving rapidly fatal, by bursting into the peritoneum, has been brought under our notice; and two ovaries containing large serous sacs, probably in the first stage of enlargement.

A large concretion composed of human hair, taken from the stomach of a lady of weak intellect, has been exhibited, the chief interest connected with which was the long time it had withstood the solvent power of the gastric juice—each individual hair being quite perfect; its form was singular, having been moulded by the action of the muscular coat.

A case strongly supporting the views of the modern humoralists has been detailed, where, from the supposed existence of the poison of rheumatic fever, the patient had arachnitis, endocarditis, and synovitis. Here, though different parts were affected in succession, we can scarcely say there was *metastasis*, since the disease did not abate in one part as it advanced in another.

Our associate chemist has, during the past session, favoured us with the account of a new and useful test for arsenic (Reinsch's,) by which he was able readily to detect the presence of that mineral in the mamma, liver, spleen, stomach, &c. of a patient who died from its application to the skin of the breast in the form of a plaster for the cure of a supposed cancer.

The pleura and lung, a mass of diseased bronchial glands, and a scirrhous tumour of the uterus from a patient who died three years subsequently to the removal of a scirrhous mamma, have been added to our museum.

Two cases of granular degeneration of the kidney have been brought before us, one complicated with enormous cerebral hæmorrhage, the other with enlargement of the heart, and regurgitation through the tricuspid valve.

An ulcerated bladder in connection with both kidneys tubercularly diseased, and another affected with *carcinoma reticulare*, the disease spreading along the mucous membrane of the ureters to the kidneys, have been exhibited to the society.

Several cases of fracture of the skull, terminating fatally, have been brought under our observation, which were remarkable for the variety and obscurity of their symptoms, and the difficulty of explaining those present, when the extent of injury was discovered.

We have had to record a melancholy instance of sudden death from perforating ulcer of the stomach, where the patient, however, lived for three days; and another where death took place in thirty-eight hours from rupture of the intestine by external violence.

A coloured drawing of a sloughing ulcer of the umbilicus, occurring ten days after birth in a female child, and proving fatal in four days, has been exhibited.

We have had before us two specimens of aneurism of the aorta, one of which was attended by circumstances of unusual interest. An individual was likewise introduced to the society who for six months had presented a distinct thrilling at the upper part of the sternum, with loud grating aneurismal murmur. With the exception of a slight bronchial attack, which was easily subdued, his general health had been good, the only symptom being occasional shortness of breath on exertion.

Eight cases of disease of the heart have been recorded, occurring in different classes of people, and attended by various complications. The duration of the disease has varied from ten days to several years. The term of life the patients have attained has been from twelve to fifty years. In three out of the six cases where a history has been given, the deaths have been sudden and unexpected. In one case the disease was confined to the tricuspid valve; in another, enlargement of the right ventricle was accompanied by considerable regurgitation through the same orifice. In the other cases, the seat of disease was the mitral or aortic valves. In one instance where there were atheromatous deposits in the aorta and hypertrophy of the heart, complete adhesion of the pericardium was found. There was, however, no symptom in life to indicate its existence, the patient dying in the midst of apparent health, after having drunk to such excess that the heart exhaled a strong alcoholic odour. In two instances, disease of the heart has been complicated with granular degeneration of the kidneys; in another with synovitis and arachnitis. In one case only has the complaint been attributed to rheumatic fever, and even in that there was great room for doubt. In the majority intemperance seems to have been the exciting cause.

In this department of pathology much yet remains to be done, which can only be effected by extreme care and accuracy in noting the history and symptoms of these formidable diseases.

Nor can we propose to ourselves a more noble object than the discovery of some plan by which we can promote their cure or mitigate their severity; an object which I trust the society will ever (as it always has done) bear in mind; since, apart from motives of curiosity, the only legitimate reason for pursuing pathological investigations, is that we may be enabled to deduce from them observations which will benefit the living.

## I.—1. *Cases of Compound Fracture of the Skull with Depression.*

By J. M. Banner, Esq., Surgeon to the Northern Hospital.

Case 1.—Thomas Crosbie, aged 14, was admitted into the Liverpool Northern Hospital on Wednesday, 27th of November 1844, at half after 6 P. M. He suffered from compound fracture and depression of a small portion of the frontal bone a little to the right of its centre. A transverse wound of three inches in length, penetrating the integuments and muscles of the abdomen, and allowing the protrusion of a knuckle of intestine, occupied the left iliac region.

*History.*—The subject of this case was apprentice to an architect, and after leaving the office on the night in question, which was very dark, fell into an excavation in the street that had been left unprotected by some gas-light labourers. It is supposed that some of the tools used by these men in the repair of the pipes, or a portion of the iron pipe itself inflicted the wounds.

Two years ago he suffered from enlarged glands in the neck, which terminated in abscesses. He was confined several months at this time. With this exception he enjoyed good health. He was tall, well-formed, and strong. He was insensible when picked up by the police. In a few minutes he perfectly recovered his senses, and was brought to the hospital. He complained of great pain in the head, cheek, and right side of the jaw; the pulse was weak and frequent; the surface warm; the pupils acted readily; his face and neck were covered with blood, which was flowing freely from the forehead, where there was a small wound, at the bottom of which a depression of the skull could be distinctly felt.

The wound in the abdomen was not discovered until the patient was put into bed, when the oozing of blood from it first drew attention tō the part. It was three inches in length and valvular, the opening in the integuments being above that in the muscles. There was a knuckle of intestine protruding covered by peritoneum.

*Treatment.*—The hæmorrhage from the head was arrested, cold lotion applied to it, and warmth to the feet. The intestine was readily reduced; the edges of the wound drawn together, and supported by a compress and bandage.

At 8 P. M. the house-surgeon found him insensible; he could not be roused; the pulse was slow and full; the pupils much dilated and insensible to light; the right pupil more dilated than the left; the extremities appeared paralysed, and on being pinched, gave no evidence of sensation. The surface was rather reduced in temperature. The patient made several ineffectual attempts to vomit. Shortly after this he was seized with convulsions. The twitchings were confined more to the left than the right side of the body. The fingers were contracted; the face turgid. During the convulsions he frothed at the mouth, and when they subsided he vomited. The matter ejected was mixed with blood.

At 9 P. M. I saw the case for the first time. He was unconscious; breathing slow and laboured, with a stertorous sound; the pupils were dilated, and did not contract on the admission of light; the pulse was slow and of good volume. He had just recovered from a second convulsive fit. He had twitchings of the left arm and leg, but no feeling in them. It was deemed advisable to elevate the depressed portion of bone. The wound was enlarged by incision. The fractured portion of bone was found isolated, of the circumference of a half-crown piece. Several loose portions of bone were removed and the depressed piece raised, on which a considerable quantity of fluid blood escaped from the interior of the skull. Immediately after the operation the patient became perfectly conscious, he answered questions put to him, and begged to be left quiet. The edges of the wound were drawn slightly together, and cold lotion applied to the head.

28th. He passed a quiet night; he was perfectly sensible and intelligent. He stated that he had soreness in the wound of head, and experienced a dull burning pain in the abdomen, worse near the wound, with tenderness on pressure. The tongue was much furred, though moist. He complained of thirst. The pulse was 94 and jerking. It is unnecessary to give a daily record of the symptoms and treatment in this case. Symptoms of peritonitis quickly manifested themselves, which were treated on a strict antiphlogistic system. He continued perfectly conscious from the time of the operation, complaining little of the head, and directing all our attention to the abdomen. The symptoms of peritonitis never at any time appeared very urgent. He never experienced any great amount of pain, not even when pressure was made. The tympanitis was rarely oppressive. The most distressing symptom was thirst. The arm from which he was bled inflamed, and there was great swelling and pain of that member, with all the symptoms of phlebitis. On the 4th of December, (eighth day from the accident.) he became much worse; the tongue was dry and covered with a black fur; the face was flushed; the pulse 140 and weak; in the night he had low muttering delirium, and on the following day he died. This latter state appeared, in a great measure, ascribable to the phlebitis.

*Autopsy 24 hours after death.*—On opening the abdomen the whole of the viscera were found covered with a thick layer of lymph, which could be separated in large pieces, and slightly agglutinated them to each other, but no serum was effused. The peritoneum lining the parietes of the abdomen was opaque and somewhat thickened; on removing the lymph there was a very slight degree of redness observable. The wound extended to the peritoneum, but did not perforate it. Under the peritoneum for some distance around the wound was a good deal of ecchymosis, and at this point there was a greater deposition of lymph.

In the chest, on the left side, were found several ounces of bloody serum. In the right there was also some effusion of fluid, similar in character, but less in quantity than in the left. The bronchial tubes on the right side contained some frothy bloody mucus. There was no fracture of the ribs.

In the head, at the seat of the fracture, there were several small coagula attached to the *dura mater;* a fissure extended to the ethmoid bone; the *crista galli* was loose but perfectly in situation. There was no appearance of inflammation of the membranes, no lymph or purulent matter. On removing the *dura mater*, the vessels on the surface of the brain were found slightly injected, and on cutting into its substance there appeared a little increased vascularity. With this exception the brain was perfectly healthy.

On removing the integuments of the left arm, the cellular tissue for a few inches above and below the elbow was observed to be much injected with serum, and hard. The veins were carefully dissected out and minutely examined. The one punctured in bleeding was the cephalic. It was much thickened in its coats, and resembled an artery for about three inches above the puncture and five or six below it. Its lining membrane was pale and healthy looking. The edges of the puncture were not united. One of the *venæ comites* of the brachial artery presented a similar external appearance from the bend of the elbow for three inches upwards. On slitting it open it was found filled with purulent matter and blood. The lining membrane looked slightly increased in redness at this point. One of the veins on the inner side of the elbow also presented evidence of disease; its coats were thickened and knotty, which was found to depend on the presence of several small isolated coagula in the interior of the vessel. The brachial, radial, and ulnar arteries were examined, but afforded no evidence of disease.

The heart, *vena cava,* and other large veins were carefully examined and found healthy.

*Remarks.*—In the case just related, it will be remarked that sensation returned as soon as the operation of trephining had been performed. It is, therefore, reasonable to conclude that the convulsions and the unconsciousness depended on the irritation and pressure of the brain, and not on the loss of blood, which had been very considerable. It will be remembered that the pulse was slow and of good volume, and that on removing several pieces of loose bone and raising the depressed portion, a considerable quantity of blood flowed from within the skull, on which consciousness immediately returned, and the paralytic symptoms disappeared.

It is worthy of observation that the pulsation in the radial artery at the wrist was extinct for three days before death, probably depending on the state of the arm.

The activity of the peritonitis appeared to have been checked when the phlebitis, accompanied with fever of a low typhoid type, manifested itself, which probably was the cause of death.

Case 2.—Ellen Clementson, aged three, was admitted into the Liverpool Northern Hospital 25th September 1845, with a wound of the scalp on the right side of the forehead, two and a half inches in length, forming an angular flap. The pericranium was torn from the bone, which was left bare to the size of a sixpence. There was considerable swelling over the right temple from effused blood; no fracture could be discovered. There was complete collapse, the whole surface cold, pulse very quick and feeble, respiration slow, the right pupil contracted, the left dilated, partial insensibility. The injury was occasioned by a horse and cart knocking the child down in the street. It could not be proved that the horse had trodden on, or that the wheel of the cart had passed over the patient. Warmth to the surface was applied, and mild stimulants administered. In four hours she became sensible, the pupils were less irregular in their action' and the surface became warm. She vomited two or three times.

She went on well for four days. On the 29th inst. she was attacked with inflammation of the integuments of the right temple, forehead, and cheek, which, in the course of three days, extended over the entire scalp, terminating in abscess and sloughing of the cellular membrane. The symptoms which accompanied this inflammatory attack were very severe. Delirium and coma were present. As soon as the sloughs separated, which was the case in seven days, the delirium ceased. At this time a large piece of the integument covering the right temple, and extending as far as the original wound in the forehead, sloughed away, and exposed a fracture and depression of the skull. The former was about two inches in length, extending backwards through the parietal bone; the latter was at the coronal suture, where the frontal bone was separated from the parietal. The depression was not more than the sixth of an inch. A large surface of bare bone became exposed several inches in circumference. There were also several other parts of the skull denuded of pericranium, which could be discovered through the openings made for the escape of matter and sloughs. A large and painful abscess formed over the right malar bone. From this time the patient improved. The bone, which was so fearfully exposed, began to granulate, and, with the exception of a small portion, which subsequently exfoliated, but not through its entire thickness, assumed a healthy appearance. The improvement was gradual, but very marked, until the 7th of December, when she was seized with violent dysenteric symptoms. On the 9th she became comatose, and died on the 10th, having lived nearly three months from the time of the accident.

*Autopsy* 40 *hours after death.*—The body was much emaciated. There were five separate openings through the scalp situated over the occipital, parietal, frontal, and right temporal bones; the largest was over the right temporal and parietal bones, being of the size of a crown piece. It was at this point the exfoliation had taken place; the rough appearance extending for some distance under the edges of the scalp. On removing the calvarium, which was very thin, the *dura mater* was found detached from the skull to the extent of the exposed surface without, where it was somewhat thicker and paler than natural. The substance of the brain was softer than ordinary. Upwards of three ounces of sero-purulent fluid escaped from the ventricles. In the anterior lobe of the right hemisphere was a very large abscess, containing at least four ounces of purulent matter, which extended into the anterior cornu of the right ventricle. The cerebellum was softer and darker than usual.

The abdomen and chest were not examined.

Mr Banner drew the attention of the society to the extraordinary amount of disease within the skull, which he considered must have existed for a long time without any symptoms characterising its presence. He remarked that the abscess in the right hemisphere, which extended to the cornu of the right ventricle, would account for the purulent character of the serum found in the ventricles; while the dysentery, which was very acute, was sufficient to account for the symptoms preceding death. Previous to this attack the child sat up daily and took her food well. She was perfectly sensible, and the pupils acted regularly; the countenance was improving, and there was every reason to expect a recovery.

### 2. *Compound Comminuted Fracture of the Skull.* By J. H. Minshull, Esq., Surgeon to the Southern Hospital.

Richard Fairclough, policeman, aged 35, a stout, well-built man of temperate habits, was struck down, about two A. M., by a blow on the forehead, inflicted with a poker, and, while down, was again struck on the right side of the head, neither of the blows rendering him insensible. He got up immediately, exclaiming, "Oh my head!" and, after remaining with another officer about five minutes, left the yard unassisted to seek the aid of a surgeon, who lived about seven hundred yards off. After having arrived, he held a candle while his wounds were being dressed, but, during the examination, was suddenly seized with convulsions, that lasted some seconds, immediately after which he was conveyed to the Southern Hospital. When admitted, (an hour and a quarter after the injury,) he was insensible and cold, with the heart's action scarcely to be felt; the pupils contracted to a pin's point; the breathing quiet, and at long intervals. Another convulsive fit now seized him and recurred frequently during the succeeding hour. In the intervals he could speak low, though incoherently, and with reference to the fight only.

At the end of an hour and a half the feet became warm, the convulsions ceased, the patient became more sensible, and he put out his tongue or offered his hand when spoken to, though he recognised no one. He continued in this state till about seven o'clock the next night; when, after having been restless, he became violent for a few minutes, and was with difficulty kept in bed. A catheter was passed, and the bladder emptied, when these symptoms went off, and he fell asleep. He awoke conscious, calm, and collected, but with entire loss of memory; took some tea, and remained quiet till half-past 4 A. M., when he was with difficulty prevented from rising to walk about the ward. A slight convulsion followed; his pulse, which had previously been steady at 75, became, for a few minutes, too rapid to be counted, then gradually sank until he died at 5 P. M.

He was, however, perfectly sensible until within a short time of his death; memory alone being impaired.

The wound on the forehead was two inches long, cleanly cut, extending from the hair to the nose—half an inch of the skull was bare, the bone fractured, comminuted, and depressed. The extent of the fracture above and below could not be traced.

That on the right side was of the same length, semilunar, partly filled up by the protrusion of the temporal muscle, with five fragments of the parietal bone adherent to its fibres. No depression was detected. The hæmorrhage had been very considerable from this wound.

*Inspection.*—The scalp having been removed, the fracture was found to be more extensive than could have been suspected. On taking off the calvarium, a portion of bone was found depressed and firmly adherent to the *dura mater* behind the wound in the forehead, and the fissure extended into the orbit. On the right side, the fracture did not pass through the outer table, although the inner one was separated for about two inches and slightly depressed. A small quantity of blood was extravasated between the *dura mater* and the left parietal bone, on the side opposite to that on which the fracture had taken place.

### 3. *Case of Punctured Fracture of the Skull.* By JAMES BRUCE, M. D.

W. M., aged 35, a labourer in a freestone quarry, in passing behind one of his fellow workmen, who was in the act of uplifting his mattock, sustained a severe blow upon the head from the pointed end of the instrument. He was knocked down and stunned by the violence of the blow, but was afterwards able to walk home without assistance, and called at a druggist's shop by the way to get the wound dressed. The wound was not above half an inch in length, and was situated a little above the posterior inferior angle of the right parietal bone. It was attended with very little uneasiness during the first week after the accident, but from that time he began to complain of acute pain in the right side of his head, and he was observed at times to talk incoherently. The headach was always relieved by leeches and an aperient draught. There was a copious purulent discharge from the wound for nearly a fortnight after the receipt of the injury, and during the whole of that time the pain in the head continued more or less severe. The patient had a dull lethargic look and seemed disposed to sleep during the greater part of the day. He wandered occasionally at night, but was at all times easily roused into rational conversation. His pulse never exceeded 80, and his appetite was not much impaired.

On the twentieth day after the accident he had rigors attended with violent headach and increased stupor. The wound, which had been healed two days before, was again laid open, in order to evacuate a quantity of matter which had collected under the scalp in that situation. Pulse 100, firm. The patient was bled from the arm with relief. Next morning he took a little food, and asked his attendant if he was likely to recover. His headach continued very severe. In the forenoon he became suddenly comatose, pupils were dilated, and breathing laborious. At this time an operation was proposed by the surgeon in attendance, but it was objected to. The patient died about two o'clock.

*Inspection.*—The pericranium around the seat of injury was much thickened and of firmer consistence than usual. The part of the skull corresponding to the external wound was bare to the extent of a half-crown piece, and was the seat of an opening about a quarter of an inch in its transverse and longest diameter. The appearance of the fracture was precisely what might have been anticipated from the form of the instrument. The opening was caused by a depression of the superior edge of the fractured bone, and was wider above than at its lower extremity, which communicated with the cavity of the cranium. On removing the skull-cap, three angular projections from the internal table were found to correspond with the lower part of the external opening. These projecting pieces of bone converged at their apices so as to form a funnel-like termination to this opening, and their pointed extremities had penetrated the membranes and become imbedded in the substance of the brain. The superior fragment communicated with an abscess of the right cerebral hemisphere somewhat larger than a walnut, which was situated a few lines below the surface. The abscess contained some greenish-yellow pus, and a communication existed between it and the lateral ventricle, which was filled with the same kind of matter. The opening in the *dura mater* was surrounded with a coating of lymph, and its edges were slightly thickened. There was no pus in the left ventricle of the brain. The under surface of the cerebellum and *medulla oblongata* were thickly coated with lymph.

In cases of punctured fracture of the skull, the employment of the trephine previous to the occurrence of decided symptoms of pressure would appear to be much less objectionable than in ordinary cases of compound fracture with depression. Where a pointed instrument perforates the cranium we have almost uniformly splintering of the internal table, and the irritation caused by the projecting spiculæ of bone may lead to the formation of matter in the brain, or between the skull and *dura mater*, long before symptoms of compression present themselves sufficiently urgent to justify the operation. In a case of this kind related by Mr Liston, the patient lost the power of speech for three days, but he recovered it again after a profuse discharge of matter from the wound. He was trephined eleven weeks after the accident, and eventually recovered.

In the case related above it is probable that the formation of the abscess in the brain was the first in the series of morbid changes consequent upon the injury. From the free communication which existed between the abscess and the perforation of the skull, and the unfavourable change in the symptoms that ensued upon the closure of the external wound, we may infer that the suppuration in the brain would not necessarily have proved fatal had there been no impediment to the free exit of the matter. The well-marked symptoms of compression which immediately preceded death were obviously dependent upon the bursting of the abscess into the right lateral ventricle.

Sir E. Home mentions a similar case, in which several fragments of bone had been driven into the brain by a pistol bullet. A large abscess formed in the substance of the brain, and communicated with an opening in the *dura mater*. The patient was able to attend to his duties as a naval officer for several months, and he experienced no distressing symptoms so long as the external opening afforded a free exit to the matter.*

### 4. *Compound Fracture of Os Frontis in a child eighteen months old,—three pieces of bone remaining in the cerebrum during four months.—Recovery.* By THOMAS INMAN, M. D.

Isabella Oliver, aged 18 months, was brought to the Infirmary in her mother's arms, having just received a kick from a horse. On examination, an extensive fracture of the right frontal bone was discovered, with great loss of substance. The little finger was passed through the opening into the brain, which was extensively lacerated, but no fragments could be detected. The child did not appear to suffer from the injury. A little lint, dipped in cold water, was laid over the wound, with directions to the mother to keep it constantly wet, &c.

In a few days the brain was seen to be (superficially) in a sloughing condition, but no bad symptoms appeared. Six weeks afterwards the slough separated, excepting at one spot, where it adhered pertinaciously, evidently having very deep connections. The rest of the exposed surface was covered by healthy, florid granulations, (the different appearances of the parts being shown in a coloured drawing.) Four months after the injury four pieces of bone were found in the wound, and readily extracted; they were all rough and dry, as if they had been dead a long time, of different sizes, but in all sufficient to cover a half-crown piece.

In six days from this time the wound had cicatrized completely.

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* Trans. of Soc. for Imp. of Med. Chir. Knowledge, vol. iii. p. 94.

The union, however, was membranous only, and the brain could be distinctly seen to pulsate through it. Considerable pressure could be borne at this part without producing any particular effect.

No untoward symptom occurred at any time after the injury, if we except a slight debility while the slough was separating, indicated only by the weakness of the cry.

No other treatment was adopted than an occasional powder to open the bowels, and the continuance of water dressing.

### II.—1. *Softening of the Pons Varolii. Lead detected in the Cerebellum.* By Thomas Inman, M. D.

James M'Ginn, aged 24, painter, of robust frame, admitted into the Liverpool Workhouse with sloughing of the nates, August 29, 1844.

States that he was always a healthy man (with the exception of an attack of painters' colic) till four months ago, when he was suddenly seized while at work with giddiness, dimness of sight, pain in the forehead, weakness and numbness in his lower extremities. He had great difficulty in getting down the ladder on which he was and reaching his home, and next day was unable to leave the house. These symptoms increased in severity, and at the end of a fortnight he had lost all command over the left leg and thigh. The left arm likewise felt very weak, but never became paralytic. Pain in the head has never left him. His mind and memory have been gradually failing since the commencement of the disease.

On admission, the muscles of the face were unaffected; both pupils dilated, but obedient to a strong light; tongue protruded slightly towards the left side. The left arm is weaker than the right, but he can grasp pretty firmly with both. The left leg is completely paralysed and almost deprived of sensation,—a hard pinch or prick being necessary to excite it. The right leg is weak, but he has command over it, and its sensation is tolerably perfect. No reflex motions excited by any irritant. There is no priapism. Urine and fæces passed involuntarily. Complains of dull heavy frontal pain. The mind is weakened, the memory impaired. There is an appearance of hebetude like that in typhus. The tongue is dry and brown; the teeth covered with dark sordes; the speech is hesitating; the enunciation imperfect. Pulse 96, soft; respiration easy, abdominal. No delirium or coma; sleeps well; appetite bad. There is no blue line round the gums. Says he never had syphilis, or any injury of the head. There are extensive sloughs over the sacrum and trochanter, which have not as yet begun to separate.

Before he came into the house he had been cupped, bled, and blistered, but without relief. On his admission, a long issue was made over the sagittal suture and kept open by peas, and wine freely administered. Under this treatment he rallied for a time. The sloughs separated; the healing process commenced; the tongue became moister and cleaner; the pulse fell to 60, and the frontal pain abated. On the 13th of September, however, he was seized with severe pain in the stomach and vomiting; was found pulseless; the trunk and extremities cold and covered with a clammy sweat; his face red and flushed, but quite cold. His senses were, however, unaffected. Stimuli had no effect upon him, and he died in a short time apparently of exhaustion.

*Sectio cadaveris* 24 hours after death.—Face and scalp greatly congested; calvarium dense and thick; membranes greatly injected, but not thickened or opaque. Brain was extraordinarily firm; lateral ventricles contained about four ounces of transparent serum, and their lining membrane was slightly rough. A good deal of fluid was found also at the base of the brain. No other lesion was detected till the *Pons Varolii* was divided, when a number of small foramina were noticed filled with softening matter, more numerous on the right than the left side, and giving the idea, when they had been subjected to a stream of water, as if they had been made by worms. On making a section on the right side, a cavity was found large enough to hold a small pea. The white and gray parts of the pons were distinct, and both equally affected. The rest of the pons seemed perfectly healthy.

On incinerating the cerebellum, treating it with nitric acid, and testing it by iodide of potassium, sulphuretted hydrogen, and metallic zinc, I found that it contained a very distinct quantity of lead, which I was able to exhibit deposited upon zinc wire in the form of arborescent crystals. Being anxious to avoid any sources of fallacy, I subsequently repeated the whole of my experiments with a piece of mutton, but could not produce any precipitate with the most delicate tests.

This case presents many points of great interest. Was the presence of lead dependent upon the employment of the patient, and had it been accumulating since the time it first showed evidence of its existence by producing an attack of colic? Yet, if his system were impregnated, why was the blue line round the gums entirely absent? Again, did the lead existing in the brain determine the disease in that organ? Was it the remote cause of the softening and the effusion into the ventricles, or were these merely the effect of some other agent?

These questions I will not attempt to solve, since it would be impolitic in the greatest degree to draw conclusions from a single case, and I am only aware of one other example, a case of epilepsy, in which the disease of the brain appeared to be dependent on the presence of large quantities of lead in that organ.

## 2. *Case of Apoplexy of the Pons Varolii.* By E. Parker, Esq.

Henry Fleetwood, aged 38, a spare man, of temperate habits, was brought to the Northern Hospital, May 22, 1844, under the following circumstances. The policeman on duty at the pier stated that the patient walked up to him and complained of feeling very ill; said that he was losing his sight, and having some property in his possession, he wished to receive assistance; he then became insensible, and had a slight convulsion, which passed off in a few moments; not recovering his consciousness, he was brought to the hospital. On admission there was complete insensibility, he could not be roused in the slightest degree; the extremities were relaxed and paralysed; pupils contracted; irides insensible to the stimulus of light; respiration easy, and attended with a very slight degree of stertor; pulse 120. Shortly after being placed in bed his face and neck were observed to become much congested, and of a dark purple colour, his chest and larynx became fixed, respiration was suspended; the pulse feeble and intermittent, at last ceased to be felt; his arms were stretched out; head drawn back; mouth open. Thus asphyxiated he continued for a few seconds, when a long deep inspiration, succeeded by others of a gasping character, took place; the muscles became relaxed; the face resumed its proper colour; the pulse returned; and he appeared as when admitted, in a state of perfect coma. Fits such as the above recurred in quick succession, and he died about two hours and a half after admission.

*Autopsy* 18 *hours* P. M.—On removing the calvarium the surface of the brain was observed to be very moist; the arachnoid opaque and raised by serous exudation; the ventricles contained about two ounces of clear serum; the choroid plexus presented numerous minute vesicles filled with an opaque straw-coloured fluid. On slicing the brain it was found to be much congested, but did not present any sanguineous effusion. At the base on each side of the *Pons Varolii* small coagula were observed under the arachnoid membrane. Turning up the *medulla oblongata* another small rounded coagulum was seen protruding from the floor of the fourth ventricle. On dividing the *Pons Varolii* longitudinally it presented a cavity about the size of a walnut, filled with blood partly fluid, partly coagulated, which extended into the fourth ventricle. The walls of the cavity were very soft, of a reddish-gray colour, and of a flocculated appearance. Minute opaque spots of atheromatous deposit were observed in the coats of some of the arteries at the base of the brain.

The *Pons Varolii* is less frequently the seat of sanguineous effusion than any other portion of the nervous centre; a circumstance which may probably be explained by its greater density affording a proportionally increased degree of support to the blood-vessels which permeate it. The symptoms which characterize apoplectic lesions of this part of the brain do not appear to differ in any important respect from those which attend ordinary cases of apoplexy, or to present any peculiarity by which the seat of the effusion can be determined. Complete annihilation of the perceptive faculties, and great disturbance of the respiratory functions are observed, irrespective of the situation of the extravasation, providing this takes place to a considerable extent. Convulsions, noticed in the present instance, are not so invariably met with as materially to assist the diagnosis; indeed, it seems probable, from the experiments of Flourens, that the occurrence of convulsions should rather be attributed to irritation of the quadrigeminal bodies than to injury of the *Pons* itself. The central situation and great importance of the annular protuberance, as the connecting medium of the three great divisions of the cerebro-spinal axis would induce us at once to infer that extensive lesion of it must necessarily and quickly lead to fatal consequences. A less degree of injury is, however, by no means so fatal. Several cases are recorded by Cruveilhier in his Anatomie Pathologique, in which appearances indicative of former extravasation were found in persons who died of other diseases.

## III. *Inflammation of the Spinal Chord from injury to the Vertebræ.* By Thomas Inman, M. D.

A. B., a porter, aged 45, fell backwards against a wall, from a ladder striking his head in its descent.

Immediately after the fall he was completely paralysed, respiration being carried on by the diaphragm alone; his senses were unaffected; no particular pain was complained of; fracture was suspected, but no manipulation was resorted to for fear of increasing the mischief. The next day he was able to move his arms a little, and two days after could move his legs. On the third day the arms began to twitch, and continued in a state of tonic contraction; some power of motion remained in the legs till the sixth day, when the paralysis was complete. There was never any sensation in the lower, and very little in the upper extremities. Dull aching pain was complained of in the neck. A large slough rapidly formed on the sacrum, and death ensued on the tenth day after the accident.

*Post mortem* examination revealed a fracture through the body of the seventh cervical vertebra passing obliquely and partly through the intervertebral cartilage between this and the first dorsal. The *dura mater* of the chord was lacerated at this point to a small extent, but no effusion of blood had taken place. With this exception, all the membranes looked perfectly healthy. On examining the chord, however, an appearance was noticed anteriorly like an ecchymosis, and on making an incision at this part, the medulla was found reduced to a brownish pulp. A stream of water being gently turned upon this washed away the softened portion, leaving a cavity large enough to hold about three peas. Its situation corresponded to the giving off of the lower nerves going to form the brachial plexus. The chord was healthy in every other part.

The other viscera were examined, but presented no remarkable appearances.

### IV.—1. *Case of Disease of the Heart. Contraction of the Mitral Orifice, with insufficiency of the Valve, and Hypertrophy of the Right Ventricle.* By James Turnbull, M. D., Physician to the South Dispensary.

A woman, aged 42, came under my care the 28th November 1844, with disease of the heart in an advanced stage. She had always been delicate, and subject, for many years, to cough and asthmatic difficulty of breathing. About three months before she had an attack of hæmoptysis, which was soon after followed by another. From this time she was never able to be down stairs, and got gradually worse. I found her raised to nearly the erect position in bed, with great œdema of the legs, and so weak, that my examination was confined to the heart.

On percussion the sound in the region of the heart was not unusually dull. On placing the stethoscope over the apex, a distinct but not very loud bellows murmur was heard accompanying the first sound. The murmur was perceived below the apex towards the left side, but was scarcely audible at the base. There was no murmur in the second sound. The first sound was not dull or prolonged, and there was no increased impulse. At the lower part of the sternum the first sound was loud, and the impulse rather strong. Pulse small and weak.

*Diagnosis.*—The chief disease in the mitral valve allowing regurgitation. Little if any hypertrophy of the left ventricle. Some hypertrophy of the right, with dilatation.

The patient gradually sunk, and died on the 30th November.

*Post mortem examination.*—The pericardium contained but little fluid. An opaque white spot existed on the surface of the heart, which was larger and more flaccid than natural. The left ventricle was slightly dilated, its walls being of the usual thickness. The *chordæ tendineæ* were thickened, indurated, and shortened, so as to prevent the mitral valve from closing completely. The auriculo-ventricular opening viewed from the auricle seemed much contracted, and must have presented considerable impediment to the passage of the blood from the auricle. The right ventricle was dilated, and the walls nearly double the ordinary thickness. The loose margin of the tricuspid valve was a little thickened. The pulmonic and aortic valves were healthy, except that the *corpora sesamoidea* of the latter were enlarged and cartilaginous. Both auricles were dilated.

The right cavity of the chest contained about a quart of serous fluid. The pleura investing the anterior part of the lung was opaque and thick. The lung was compressed to about half its natural size; it did not, however, sink in water. The left lung was closely bound to the walls of the chest by old adhesions. The bronchial tubes were filled with muco-purulent fluid. The liver was enlarged, granulated, and of a pale yellow colour.

We have in this case an example of that form of disease of the heart which most commonly occasions hæmoptysis,—viz. contraction of the mitral orifice with hypertrophy of the right ventricle. It is also worthy of remark that there was no murmur with the second sound, this being in accordance with the observations of Dr Hope, who found that contraction of the auriculo-ventricular orifice did not cause a murmur unless it was considerable, and accompanied with vigorous action of the heart.

### 2. *Disease of the Heart, Hypertrophy, and Dilatation of the Right Auricle and Ventricle.* By E. Parker, Esq., House Surgeon, Northern Hospital.

John M'Cann, aged 29, a labourer, of temperate habits, admitted into the Northern Hospital, December 18, 1844, under Dr Carson. He states that his health has been impaired for four or five years; that he has suffered much from cough, particularly during the winter season, and on several occasions has had expectoration of blood. Last January had a very severe attack of chest disease, with pretty copious hæmoptysis. Soon afterwards his legs began to swell, but did not attain any considerable size until a short time previous to the present date. On admission, he presented in a very marked degree the appearance of a person labouring under an affection of the heart—his countenance was bloated, with lividity of the lips and protrusion of the eyes—he complained much of shortness of breath, and had very considerable anasarca of the legs and thighs, also of the left arm. The abdomen was somewhat enlarged, and fluctuation could be detected. In the region of the liver there was slight tenderness on pressure; surface of the body generally colder than natural; decubitus on the back or either side; cough troublesome, with rather scanty, thick expectoration, which, in the course of a few days, became frothy and mucous, and was observed to be streaked with blood;

pulse 120, feeble; tongue moist and clean; urine deficient in quantity, high coloured, sp. gr. 1014, and affords a pretty copious precipitate of albumen, on the application of heat or the addition of nitric acid.

The anterior regions of the chest between the mammæ and clavicles emit a clear sound on percussion; on the left side, the resonance is somewhat increased. In this situation the vesicular murmur is inaudible, being supplanted by loud and extensive sonorous rattles. On the right side the respiration is of a bronchial character, with a slight degree of moist crepitus. Owing to his enfeebled state, the posterior and lateral regions of the chest were not examined. The jugular veins were turgid, and on the right side presented a very evident pulsation.

Dulness on percussion in the cardiac region somewhat extended. The pulsation of the heart is seen and felt in the epigastrium, near the ensiform cartilage. The first sound of the heart cannot be distinguished, being rendered inaudible by a strong sawing murmur, which is heard most distinctly an inch below the nipple, and midway between it and the sternum, diminishing in intensity, and at last ceasing as we proceed upwards or to the left side. The second sound is not accompanied with any murmur, nor can any be detected in the course of the aorta or large arteries. Appropriate remedies were prescribed, but he became gradually worse, and died on the 24th.

*Autopsy* 18 hours after death.—Chest on the right side contains about a pint of clear serum; slight adhesions; lung much congested; at its anterior edge it presents a hard mass about the size of a hen's egg, which, on being cut into, is found to be friable and of a dirty gray colour. Other smaller portions are condensed, and one of them consists of a mass of miliary tubercles surrounded by lung in a state of hepatization. Left side of the chest contains a few ounces of serum; extensive old adhesions; a large cavity at the posterior part of the apex of the lung; considerable emphysema at its anterior edge; numerous miliary tubercles throughout the substance of the lung. The bronchial tubes on each side were filled with a frothy fluid of a reddish colour, their lining membrane being of a deep red. There was no fluid in the pericardium; heart considerably increased in size, weighs 19 oz.; the enlargement is almost confined to the right side. The right auricle and ventricle are greatly dilated, the walls of the latter being a slight degree thicker than natural. The auriculo-ventricular opening is much larger than usual, so that free regurgitation into the auricle must have taken place from inability of the tricuspid valve to perform its functions. The valve itself was healthy, with the exception of a very trifling increase of thickness at its edges. The left side of the heart is very little diseased; aorta rather small; semilunar valves healthy; also the mitral, except the most trivial thickening of its edges. The left ventricle is rather increased in size, but its walls are natural.

Abdomen contains rather more than a pint of serum. Liver much congested. Right kidney enlarged; weighs eight ounces; congested, and affected with granular disease to a slight extent. On dividing it a deposition of cheesy tubercular matter is found to occupy the lower part of the pelvis and several of the infundibula, and to have caused absorption of two or three bundles of the *tubuli uriniferi*. The left kidney is larger than the right; much congested, and presents similar indications of Bright's disease, but no tubercular deposit.

The above case is an interesting specimen of a variety of heart disease not very frequently met with. Though hypertrophy, with dilatation of the left ventricle, is perhaps one of the most common of the affections of that organ, it is rare to find the same lesions confined to the right side. In the majority of cases both sides are affected, and very generally the cause of disease of the right heart will be found to exist in the left. Forming an exception to what may be considered as a rule, it becomes an object of inquiry to ascertain what the causes are to which, in the present instance, the malady should be referred. Previous to entering upon this question, it may not be amiss to dwell for a moment on one or two points which facilitated the diagnosis. The general symptoms were sufficient to denote extensive and serious disease of the heart, and the turgescence, with pulsation of the jugular veins, in confirming this supposition, seemed, at the same time, to indicate that the right side was considerably, if not principally affected. The importance of this symptom is now generally admitted, though some difference of opinion still exists as to the manner in which it should be explained. In every case presenting it which has come under my observation, imperfection of the tricuspid valve has been detected, either from enlargement of the auriculo-ventricular opening, or some lesion of the valve itself permitting free regurgitation. The strong sawing sound heard, and indeed supplanting the first sound of the heart, was referred to imperfection of the tricuspid valve, principally from the situation of its greatest intensity, and partly from its not being propagated along the course of the large arteries.

Without a more accurate account of the patient's early history, it will be difficult, if not impossible, to arrive at a positive conclusion as to the priority of the different lesions discovered after death. We may, perhaps, with some probability, refer to the lungs as the seat of disease in the first instance; knowing that dilatation, though it may occur without, is generally the result of some impediment to the onward passage of the blood. It appears that for years he laboured under winter cough; repeated attacks of bronchitis giving rise to emphysema of the lungs, would afford such a degree of permanent resistance to the passage of the blood, as would be amply sufficient to cause dilatation of the right ventricle; and if we add to this, the debilitating influence of a scrofulous diathesis, and the additional obstruction from tubercular deposit, we have still farther reason for believing that the disease of the heart was produced by that in the lungs. The congestion of the liver was an obvious effect of the heart disease. The enlargement of the kidneys might also be referred to the same cause. These, however, were affected, in addition, with a slight degree of granular degeneration, and one of them contained a deposition of tubercular matter. With respect to the granular disease, is it to be considered a coincident affection? or has it any relation or connection with the morbid state of the heart? Among many secondary affections which arise in the progress of Bright's disease, Christison, I think, mentions the occasional occurrence of diseased heart. May not, however, the former be sometimes the effect of the latter? In other words, may not congestion of the kidney lead in time to granular degeneration? A constant state of excitement or hyperæmia, from the habitual use of spirits, is one of the most frequent causes of the change in question;—a condition in many respects analogous, evidently exists in some affections of the heart.

### V. *Aneurism of descending Aorta and right common Iliac—Ossification, &c.* By Thomas Inman, M. D.

John Skerrat, aged 75, night-watchman, of temperate habits and spare frame, was always a healthy man till one evening when he was knocked down on a heap of stones, and kicked about the abdomen and elsewhere. He was brought to the Liverpool Workhouse in a cab, and laid up with cough and smart feverish symptoms. After lying in bed for three weeks he perceived, for the first time, a pulsating tumour in the abdomen, which was partially dull on percussion, reducible in size by steady pressure, and rapidly filling again; it was not painful except when roughly handled; there was a rushing sound, but nothing like the bellows murmur.

He was discharged to an infirm house, at his own request, where he died suddenly, three months and fifteen days after the receipt of the injuries.

*Sectio cadaveris* revealed a small quantity of blood effused into the cavity of the peritoneum in the form of a few shreds of coagula. Behind the mesentery was a coagulum of dark blood, weighing about four pounds, which had escaped from an aneurism of the abdominal aorta.

On removing this vessel from the spine, to which it was firmly adherent by thick cellular connections, its enormous size was the first to demand attention, its diameter being nearly equal to that of the horse. The vessels arising from it were proportionally large. On slitting it open throughout its whole length, it was found perfectly healthy, with the exception of two small atheromatous spots, between its origin and the cœliac axis. Everywhere below this it was studded with large calcareous plates, and the arteries passing off from it were converted into bony or cartilaginous tubes, the left common iliac for about two inches being a perfect bony cylinder capable of holding a moderate-sized forefinger. The cœliac axis was dilated to a bony pouch capable of holding the end of one's thumb. The aneurismal opening was situated anteriorly, just below the superior mesenteric artery. The tumour itself, which had enlarged in front only, was filled with loose coagula evidently recent. It had burst by a small aperture at the side. The right common iliac likewise was aneurismal, the tumour having attained the size of a small orange. This, however, had not burst.

The *vena cava inferior* did not seem involved in the swelling; at least there was no evidence of compression, and the lumbar nerves were likewise unaffected.

Both ventricles of the heart were enlarged; but no valvular disease could be detected. Some blood was contained in this viscus, but not much. There was intra-lobular emphysema of both lungs, with here and there a dilated bronchus. The liver was indented with the right false ribs. The kidneys were of the natural size, pale, exsanguine, and granulated; the infundibula were indistinct, some apparently having been converted into granular matter.

A natural question arising out of this case was,—did the violence suffered at Kirkdale produce the aneurism? The grounds for supposing that it did are the age the patient had attained, the softness of the coagula, the subsequent progress of the tumour, and the condition of the artery.

The age of the patient—because the ordinary period of life at which aortic aneurism occurs is the fortieth year, the extremes ranging between thirty and sixty, scarcely one in a hundred reaching the age of sixty-five. If then a man shall have attained his seventy-fifth year, there is a strong presumption that he will not suffer from spontaneous aneurism.

The softness of the coagula—for when once an aneurism has been of some months' duration and increasing slowly, the clots are firm, hard, and capable even of resisting for some time the effusion of blood though the sac burst. In the case before us they were soft, flabby, and easily broken down.

The subsequent progress of the tumour—the rapidity with which it proved fatal after it once showed itself, was what we should expect from the time it first made its appearance after the injuries were received.

The condition of the artery—because the extent of the ossification was such, that, had there been an aneurismal tendency, it would have occurred long before. These reasons were not, however, sufficiently conclusive to the coroner's jury, as they returned a verdict of death from natural causes.

### VI. *Case of Hæmatemesis and Melæna; adhesion of the Stomach to the Liver from old perforating Ulcer.* By JAMES TURNBULL, M.D.

An unmarried woman, aged 28, came under my care at the North Dispensary, having been ill a fortnight with hæmatemesis. During seven years she had been subject at intervals to attacks of vomiting of blood, and all that time had suffered more or less pain at the stomach. She became a mother at the age of 21, always enjoyed good health, and was regular in her catamenial periods till the hæmatemesis commenced. From this time she was never regular, and the catamenia returned only after long intervals. She had severe pain at the stomach, which was increased after every meal, but especially after dinner, so that in the afternoon she had frequently to lie down in consequence of its severity.

In December 1841 she had a very severe attack of pain, for which leeches were repeatedly applied. Her last attack of vomiting of blood occurred about the time of her application at the dispensary, and she continued to vomit as well as to pass blood by stool to the time when I first saw her. Her appearance did not, however, undergo much alteration, and her appetite kept good until two days previous. She then became much altered and very pale; the countenance being completely blanched, and the whole surface of the skin pale and bloodless. The matter vomited was of a dark colour, resembling coffee grounds mixed with tough mucus. Her stools were very dark-coloured and watery. The pain at the epigastrium and sickness had ceased. Pulse 132, weak. She had several fainting fits, during which she became stiff and lost the power of moving, but remained conscious of what was going on around her. Some pills with the acetate of lead and opium were prescribed. She died, however, the following morning, while in the act of vomiting a small clot of blood.

*Inspection.*—On opening the abdomen the small curvature of the stomach was found adhering to the concave surface of the liver; the stomach was very much contracted and drawn in towards the adhering part. When opened it was found that where the adhesion existed there was a circular depression about the size of a sixpence formed by an old perforation of its coats. The edges of the ulcer had become firmly united to the liver, so that a portion of the concave surface of that organ formed the base of the depression. There was an irregular-shaped whitish patch on the mucous membrane of the splenic extremity of the stomach, which seemed to be the cicatrix of an old ulcer. The appearance somewhat resembled what might be made by touching some powdered chalk with the point of the finger, and then placing it upon the mucous membrane. There was also a slightly red patch at the splenic extremity, from which it is possible that blood might have exuded. The stomach, the duodenum, and the upper part of the jejunum were externally of the natural colour; but the lower part of the jejunum and the whole of the ileum were externally very dark, and being opened were found to contain a blackish fluid. The internal surface had a brownish-red discoloured appearance.

The liver, spleen, pancreas, and uterus presented no marks of disease.

It would seem that the great loss of blood which caused the death of the patient was the effect of exudation from the mucous membrane of a large portion of the jejunum and the whole of the ileum, for these portions of the intestines were externally almost perfectly black, whilst the duodenum, the upper part of the jejunum, and the large intestines were of the natural colour, although they also contained dark-coloured fluid. The perforation of the stomach probably took place three years before her death, when she had the severe attack of pain for which she was leeched.

Perforation, when it does not prove fatal, seems to cause adhesion of the stomach to the liver more frequently than to any of the neighbouring organs. Dr Abercrombie has collected from his own practice, as well as from the writings of others, several cases of adhesion to the liver. M. Amédée Lefevre, in a paper published in the Archives Générales de Medecine, has detailed two cases where the escape of the contents of the stomach into the cavity of the abdomen was prevented by adhesion to the spleen. In some instances, also, the stomach has become adherent to the diaphragm, and in others to the colon. In the majority of such cases, it is probable that adhesive inflammation unites the two organs before the perforation is complete. There is, however, reason to believe that in a few instances in which it is not so, recovery has still taken place, when from an early period rigid abstinence, perfect quiet, and opium have been prescribed.

We are still much in the dark as to the causes of perforation of the stomach from simple ulceration. It has, however, been long known that the disease is much more common in women than in men; and Mr Crisp, (Lancet, Aug. 1843,) has shown, from a table of 51 cases, that 39 were females and only 12 males, that the majority of the females were unmarried and between 15 and 30 years of age, and that in most there was chlorosis or some uterine irregularity. In anæmia, pyrosis and painful digestion are very common symptoms, and as they in most cases precede perforation of the stomach, we should perhaps regard the uterine irregularity and these symptoms as effects of a common cause; and it appears by no means improbable that the functional disorders of the stomach caused by anæmia may in some cases induce such structural changes as ulceration and perforation.

### VII.—1. *Case of Intestinal Obstruction; Sigmoid Flexure strangulated by the Ileum.* By E. Parker, Esq. House-Surgeon to the Northern Hospital.

Robert Black, aged 44, admitted into the Northern Hospital, May 16, 1844, under Dr Hannay, is a powerful mechanic, of intemperate habits, and accustomed to drink large quantities of beer. During the last fortnight he has been taking iodide of potassium, sarsaparilla, and blue pill for a syphilitic affection of the skin. Early on Monday morning the 13th inst., he was seized with intense pain in the abdomen, and frequent, almost incessant, desire to go to the water closet without being able to void any thing. He vomited several times during the day, and experienced slight relief from some brandy and water which he had taken, and a large opiate prescribed by a medical gentleman called in to attend him. On Tuesday a very copious and offensive motion was passed, and afforded slight temporary relief. On Wednesday the tenesmus was almost constant, no fæcal matter was voided, but occasionally small quantities of a bloody fluid; he vomited two or three times, and in the evening his abdomen began to swell. When admitted to the hospital on the following day he appeared greatly exhausted, in a state of complete prostration, countenance anxious, depressed, and indicative of great suffering. Abdomen painful on pressure being applied, and somewhat tumid. Tenesmus incessant and very urgent, nothing being passed except a small quantity of bloody fluid; has now no vomiting or sickness; tongue furred in the centre, moist, and rather cleaner at its edges; pulse quick and small. Calomel and opium, opium suppository, and fomentations to the abdomen were prescribed. The same symptoms continued without undergoing any mitigation. In the evening he complained of not having passed any urine. On examining the abdomen a globular swelling was felt at its lower part, which seemed to be the distended bladder, but on introducing a catheter, only about half-an-ounce of urine was removed. During the night he became rapidly worse, and died early the following morning.

*Inspection.*—Abdomen tumid and tympanitic. On opening it, a considerable quantity of reddish serum and flakes of lymph escaped. The small intestines were glued together by recent lymph, and were much distended by flatus and fluid. The pelvis contained several folds of the ileum, of a dark purple, almost black colour. The whole of this portion was much inflated, softened in texture, and easily torn. In one part was observed a longitudinal laceration, three inches in length, of the serous coat, produced apparently by the distension. Another portion of intestine, which proved to be the sigmoid flexure, was of the same dark colour, thickened in its coats, and also much distended with flatus and a reddish fluid; its mucous membrane was deeply congested, soft in texture, and resembled velvet. That portion of the mesocolon connected with the sigmoid flexure and involved with it in the stricture, was also deeply congested and much thickened. On further examination, the intestines were found to be curiously twisted. The base of the sigmoid flexure was encircled and pretty firmly girt by the ileum in the following manner;—tracing the ileum back from its insertion into the cæcum, it passed in-front of the sigmoid flexure, then turned round behind it, passing between it and the spine into the pelvis, which contained about five feet, presenting the appearance above described. A finger could be passed from the rectum and descending colon upwards into the sigmoid flexure, also from the cæcum along that portion of the ileum which formed the knot.

The singularity in the mechanism of the obstruction in the above case is such as to render it worthy of notice. Several instances are recorded in which death took place from twisting of the sigmoid flexure upon itself, and in works devoted to this subject numerous other modes are mentioned, in which internal strangulation has been effected. The sudden accession of the symptoms, and their extreme urgency, might lead to a belief in the existence of some mechanical obstruction to the passage of the intestinal contents; and the tenesmus, which formed so prominent a feature in the case, might give rise to a suspicion that the seat of this obstruction was not far from the rectum. Little stress, however, can be laid on either of these circumstances. Ileus of the most violent description may occur and prove fatal, without any mechanical obstacle being detected; whilst the sigmoid flexure, or even the upper part of the rectum, may be twisted without giving rise to tenesmus. The possibility of affording assistance by a surgical operation renders accuracy of diagnosis of extreme importance. That cases occur which admit of relief by section of the abdominal parietes is unquestionable, but until they can be distinguished from others, in which such interference would be worse than useless, the proposition cannot be entertained. In the present state of our knowledge I fear we possess no means of deciding with certainty either the nature or seat of the obstruction, or even if any mechanical obstruction exists at all. The researches of Dr Barlow, as detailed in a valuable paper on this subject in Guy's Hospital Reports, have certainly done something to elucidate the diagnosis of these obscure and difficult cases, at least as regards the seat of the affection. Should the circumstances pointed out by him be sufficient to enable us to determine the seat of the disease, we have still to decide a most important question—its nature, and if this is such as to admit of removal. With respect to the cause of the singular displacement observed in the present instance, I am unable to offer even a probable conjecture. No malformation of the sigmoid flexure existed, and though the mesentery was necessarily somewhat elongated, this was not unlikely an effect of the dragging induced by the altered state of the parts, nor is it necessary that any previous alteration should exist to enable them to assume so unnatural a position. I have succeeded several times on the dead subject, in effecting an arrangement similar to what has been described. This is readily done on thin flaccid subjects, in whom the mesentery is little loaded with fat, by raising the sigmoid flexure with the left hand and pushing the lowest portion of the ilium behind it into the pelvis with the right. On inflating the portions of intestine above and below the knot, they will be found to maintain their position, and to present, indeed, a perfect *fac simile* of the preparation described. The tympanitic state of the bowels contributed in no slight degree to keep up and increase the strangulation. The constricted appearance of the parts forming the knot, and the intense congestion of those portions of the intestine suffering from its effects indicated the severity of the strangulation, and the utter hopelessness of all remedial means for its relief.

### 2. *Rupture of Intestine from external violence.* By J. M. Banner, Esq., Senior Surgeon to the Northern Hospital.

Nelson Paulson, aged 28, sailor, of temperate habits, fell into the hold of a vessel, a height of eighteen feet, alighting with his abdomen across the edge of a barrel. On admission into the Northern Hospital shortly after, he complained of pain in the belly, and there was the appearance of a bruise and slight excoriation between the umbilicus and pubes. There were no signs of collapse; the pulse was unaffected; and fomentations alone were ordered.

In a few hours the pain and the tenderness on pressure were extreme, and were increased by drawing a deep inspiration.

Next morning he was found to have passed a bad night, to have suffered from frequent vomiting and incessant thirst. The features were pinched and anxious, and the mental depression great; the skin hot and dry; the tongue moist, and covered with a thin white fur; the pulse small, quick, and feeble; the abdomen was swollen, hard, and excessively tender when touched. At noon no urine having been passed, the catheter was introduced, and drew off eight ounces of highly coloured water. After this, in spite of leeches, venesection, calomel and opium, &c. he grew rapidly worse. The vomiting became constant, alternating with distressing hiccough; the pain became insupportable; the distension of the abdomen greater; the bowels remained costive; and he died exhausted early the following morning, having lived thirty-eight hours after the accident.

*Post mortem.*—Peritoneum highly inflamed, and everywhere coated with a thick false membrane; turbid serum existed in great abundance charged with flakes of lymph.

On examining the intestines a wound was found in the ileum, the edges of which were pouting and turned back, and through which a small quantity of fæcal matter had escaped into the abdomen.

## VIII. *Splenitis.—Partial Pleurisy.* By Thomas Inman, M. D.

E. J., aged 20, a tall sailor of robust frame, but very sallow complexion, admitted into the Liverpool Infirmary, August 31st 1843. States that he was on the coast of Africa three months ago, when, without any previous ailment, he began to suffer from severe pain in the left side and swelling of the body, which he attributed to his having slept all night on the ship's deck, (while it was lying in the river), and getting wet through with rain or heavy dew. Shortly afterwards his legs began to swell, and he was quite incapable of working.

When admitted the legs were swollen though not to a great extent. There was the appearance of great debility; but he was able to walk to his ward without any assistance. No renal, cardiac, or pulmonary disease could be detected; but on examining the abdomen considerable tenderness was noticed over the left side, where there existed a large indurated swelling extending inferiorly as low as the iliac fossa, and anteriorly as far as the median line. The pulse was rapid and wiry; the skin hot; appetite bad; thirst complained of; diarrhœa severe; pain in the left side constant; dyspnœa considerable; decubitus chiefly on the back, with the knees drawn up; urine depositing abundance of lithates.

The remedial measures employed appeared to make no impression on the disease, and he died gradually, apparently of exhaustion, about a fortnight after his admission.

*Autopsy 20 hours after death.*—On opening the abdomen the spleen was found immensely enlarged, and universally adherent by firm connections to the liver, kidneys, and diaphragm, and by loose ones to the intestines and omentum. The fibrous capsule was somewhat thickened, and in some places of a cartilaginous consistence. On dissecting it away from its connections, its weight was found to be six pounds and a quarter. On dividing it the greater part appeared largely lobulated, harder than usual, and very vascular; and here and there were interspersed large patches of a yellowish-white deposit, irregular in size and shape, and abruptly terminating in a bright-red margin, and appearing to consist of solid fibrine. There was no external indication of the locality of these deposits. The pleura covering the diaphragm on the left side was inflamed, (evidently from extension), and this had given rise to a thick false membrane and a large effusion of turbid serum carnifying the left lung. The heart's position was unchanged.

All the other viscera were healthy.

This case presents two interesting points for consideration. The peculiar sallow and anæmic appearance of the skin, 'and the fact that the malarious poison affected the spleen only. This last is an uncommon occurrence where the patient is young, robust, and subject to the poison for the first time, though not under other circumstances. My friend, Dr Trench, informs me that he has in the West Indies frequently observed the effect of miasma in producing enlargement of the spleen, without any preceding or accompanying intermittent or remittent fever. This was generally among natives, or those long resident in malarious districts; and it was in them observed, that towards the fall, or after the rainy season, the skin became of a yellowish sickly hue, and the spleen enlarged without pain, but with anorexia, and the ordinary symptoms of dyspepsia. The crisis or termination of the attack was usually by a melæna, which appeared to relieve the congestion After a few years the spleen became permanently enlarged and indurated. He has remarked, too, that healthy Europeans frequently suffered severely from the fever, both at spring and fall, without producing this enlargement; but that if there ensued any debility of constitution, then, in proportion to the enlargement of the spleen, the patient was exempted from the febrile attacks. In all these cases quinine appeared to act most remarkably, much more so than could be accounted for by any mere tonic property of the medicine.

## IX. *Arachnitis, Endocarditis, Synovitis.* By THOMAS INMAN, M. D.

Jennet Rogers, aged 12, was admitted into the Fever Hospital October 14, 1844, under my colleague, Dr Gouthwaite. States that she is a water-carrier in very destitute condition, and much exposed to the inclemencies of the weather; was taken ill six days ago with shivering, pains in the limbs, back, and head, nausea and vomiting.

On admission, the face was flushed; the skin hot and dry; the tongue covered with white fur; pulse 120; bowels confined; thirst urgent; pain was complained of all over the body, especially in the head; sleeps badly, but has no delirium or spasms. The treatment generally was antiphlogistic, and directed principally to the relief of the headach.

Little alteration took place till the 19th, when she had a short dry cough with hurried respiration; the pain in the head abated at the same time, and the pulse fell to 100. A day or two after, the pulse rose again to 120, the patient slept a great deal, and the face became congested, as at the first.

On the 28th, severe pain was complained of in the right knee and leg, but the cough was relieved and the face less flushed. The next day, however, the respiration was again hurried, with sibilant rattles under the clavicles; pulse 120; tongue dry, inclining to brown; thirst urgent; the right knee hot, swollen, and excessively tender; and the face greatly congested.

November 2d, Patient complained of pain all over the body; the left ankle was swollen, hot, and tender; there was tenderness over the descending colon; scalp cool; face congested. Next day both legs became equally painful, especially at the knee and ankle joints. The other symptoms persisted. She continued in this state till the 6th of November, when the pulse, from being weak and thready, increased so as to become full and strong; less pain was complained of on touching the lower extremities. The face, however, was pale and anxious; the tongue moist only at the edges. In the evening there was excessive irritability; congestion of the face; coldness of the feet; the pulse was imperceptible; and the pupils dilated. Two hours afterwards she fell into a state of coma, and died next day, November 7th, at noon.

*Post mortem examination.*—Calvarium easily detached from *dura mater;* outer surface of this membrane healthy. The arachnoid covering its inner surface was coated with a thick yellow deposit of lymph, evidently recent; and there was considerable effusion of turbid serum into the arachnoid cavity. The arachnoid covering the brain was not diseased to the same extent, but was every where studded with deposits of lymph. The *pia mater* was transparent and of its ordinary texture. The inflammation had evidently been most intense at the upper parts of both hemispheres, although it existed at all parts of the surface of the encephalon. The brain itself was apparently sound.

The pericardium was perfectly healthy. The tricuspid valve was covered with recent granulations like warty excrescences, and very faint white spots (incipient deposits) were seen at the base of the aortic and mitral valves.

The right knee-joint was filled with thick tenacious purulent matter, and the synovial membrane covering the cartilage was rough, but nowhere ulcerated. There was no decided redness of any part of the synovial membrane. The examination did not extend farther, as the friends were anxious to prevent much mutilation of the body.

The foregoing case, the history of which was furnished by the house surgeon, is of no ordinary interest. On her admission, it was considered to be rheumatic fever, though I cannot learn that there was either the characteristic odour, or any moisture on the skin, both of which are ordinarily met with. It may, however, have been a peculiar modification of the disease, whose virulence expended itself upon the internal organs, rather than on the skin and joints. Be this as it may, no reasonable doubt can be entertained that the blood was contaminated either by the presence of some extraneous poison, or by the absorption of purulent matter from the part originally affected. We have seen in the case of the late Dr Ingleby similar effects produced by an analogous agency, the poison being that of gout.

Independently, however, of the origin of the complaint, its course is worthy of attention. No sooner is the heart seized than the cerebral symptoms temporarily abate; both, however, after a day or two, progress as it were on an equal footing. No sooner are the joints affected than the thoracic and head symptoms are relieved, though after a day or two all these are equally prominent. This temporary suspension of one part of the disorder was, I am informed by Dr Gouthwaite, very marked. It seemed as if the system, taken by surprise, could only attend to the new complaint, and required time to accommodate itself to the new state of things.

What shall we say regarding an arachnitis so intense, yet producing so few symptoms, as to be wholly unsuspected? Where were the delirium, convulsions, and agonizing pain, which usually mark its invasion and progress? Where the profound coma which precedes dissolution by many days? It only adds one more to the numerous list of diseases of the encephalon, whose characteristics are as uncertain as the functions of its respective parts.

### X. *Granular Degeneration of the Kidneys, Disease of the Heart, Apoplexy, Death.* By J. P. Harris, Esq., Surgeon to the Eastern Dispensary.

Richard Eves, aged 46, boatman, of middle conformation, and of reported temperate habits, was admitted into the Northern Hospital, October 2, 1844, under Dr Hannay.

About six months ago he began to be affected with cough and difficulty of breathing, which his wife describes as "asthmatic attacks." Six weeks prior to his admission, his legs became anasarcous, which symptom continued to increase up to the period of his entering the hospital.

*Present symptoms.*—Considerable swelling of the legs; difficulty of breathing amounting to orthopnœa; cough very troublesome, with copious mucous expectoration; there is little febrile disturbance; skin cool but dry; tongue clean and moist; appetite good.

The impulse of the heart stronger than natural, but no decided indication of heart disease can be detected. The chest yields a clear sound on percussion. Sonorous and sibilant, with here and there a little mucous rattling, are heard in various parts. About a fortnight after his admission, there were very decisive symptoms of effusion into the left side of the chest. The urine on being examined was found to be of low specific gravity, viz. 1013, affording a very copious deposit of albumen by heat and nitric acid.

The treatment was directed to relieve the bronchial symptoms, act on the cutaneous surface, and increase the activity of the absorbents, which had the effect of inducing some mitigation of the more urgent symptoms.

On the evening of October 31st, the nurse came to say he was "taken in a fit." On entering the ward, he was found supported in bed and nearly insensible, pulse rather slow, breathing exceedingly difficult and gasping, action of the heart rather strong, right pupil dilated, left a little contracted. He gradually became more insensible, the difficulty of breathing increased, and he died about an hour and a half from the time of seizure.

*Inspection.*—On opening the chest considerable serous effusion was found in the left side and a slight amount on the right, as well as in the pericardium. The bronchial mucous membrane was much congested. The heart was firmly contracted; the muscular substance of the left ventricle considerably hypertrophied, but the cavity of a natural size. There was no valvular disease.

The abdominal viscera were healthy save the kidneys, which were reduced to nearly one-half their natural size; their tunics tore off with considerable ease, and exposed a pale, finely granulated surface; the greater portion of the cortical substance seemed obliterated, and the tubular structure was very much encroached upon.

On removing the calvarium, the convolutions of the brain were found very much flattened. There was a large clot in each lateral ventricle, which seemed to have proceeded from the substance of the right middle lobe, which presented a large cavity with rugged edges, and softened parietes containing a coagulum, which also extended into the third and fourth ventricles, as well as to the inferior surface of the cerebellum beneath the arachnoid.

The above case of renal disease is of interest principally on account of being complicated with disease of the heart and cerebral hæmorrhage. The existence of albumen in the urine, accompanied with a diminution of its specific gravity, may at all times lead us to apprehend the sudden invasion of cerebral symptoms through the alteration which the blood is then known to undergo. A tendency to hæmorrhage is not uncommonly one of the effects. In the present instance, the *immediate* cause of the apoplexy was probably due to the too powerful action of the left ventricle on an already weakened or diseased brain.

It is perhaps difficult to say whether the hypertrophy of the heart or the disease of the kidneys was the primary lesion; the co-existence of the one with the other has been so repeatedly observed as to induce many to believe they must have some necessary connection. In the present instance, there was no valvular disease or lesion of the arterial tunics discoverable, and as the enlargement of the heart was confined to the left ventricle, it can hardly be considered to have arisen from the bronchial affection. The absence of congestion of the liver and other abdominal viscera may perhaps lead us to infer that the bronchitis and the hypertrophy were of comparatively recent origin, and probably subsequent to the disease of the kidneys. Their disorganization was very extensive, and doubtless must have existed long prior to the patient's admission into the hospital. The absence of anasarca in the early stage of the disease would not justify the conclusion that the kidneys were sound, since it is now pretty well ascertained that renal disease may exist apart from any dropsical symptoms.

## XI. *Case of Apparent Spontaneous Displacement of a Cataractous Lens.* By R. Hibbert Taylor, M. D.

Patrick Connor, aged 45, a warehouse porter, came to my Dispensary some time in March of this year complaining of pain and dimness of sight of the left eye. On examination, I found some scattered vascularity of the conjunctiva of the palpebræ and globe, assuming on the latter the form of an imperfect zone round the cornea. The eye watered frequently and there was intolerance of light. The cornea was slightly hazy over its lower third. The right pupil was of medium size and perpendicularly ovoid; the left was about one-third larger, drawn downwards and outwards, but of normal figure. The left iris was tremulous, and the movements of both were slow and limited, especially that of the left.

On looking through the right pupil, a smoky grayish-yellow opacity was visible deep in the eye, apparently about the situation of the centre of the crystalline lens. The anterior chamber of the left eye was partly occupied by an opaque body of a grayish-white colour, and somewhat quadrilateral figure, being thicker at the centre than at the circumference, which was bevelled off to a fine edge. In size it equalled a quarter of a pea. It lay at the lower and outer part of the aqueous chamber, concealing about one-third of the pupil. It did not appear to be moveable, as the greatest possible inclination of the head in any direction did not alter its position.

The patient was able with the right eye to read a small type easily; but with the left he merely distinguished something black upon the paper. He could, however, make out large objects with this eye tolerably well.

His general health was said to be good.

Examined catoptrically, the inverted image could not be seen in the right eye, and the deep erect one was only faintly discernible through the opacity behind the pupil. In the left eye neither of the images could be distinguished. The opaque body in the anterior chamber rendered the examination rather difficult from partially obscuring the pupil.

The patient gave the following account of himself. About three years ago he first noticed that vision with the left eye was becoming dim, and continued to decline until he was unable to see with it at all. A neighbour happening to examine the eye at this time, told him that he had a cataract in it. About eighteen months ago he was suddenly attacked with pain in this eye during the night, which awoke him out of sleep. The pain was sharp and lancinating, extending to the brow and corresponding side of the head, and was attended with profuse lacrymation. Having continued during six or eight hours with great severity, it began to abate, and gradually declined, but the eye has never since been entirely free from pain or uneasiness.

About a fortnight subsequent to this attack he observed that vision with this eye was beginning to improve, and it has continued gradually to amend. Since I first saw him the progress has been very considerable.

He says that vision with the right eye has been less perfect than formerly, ever since the attack of pain in the left, and he thinks that it has continued to decline, though very slowly.

*Remarks upon the foregoing Case.*—My first impression on a cursory examination of this patient's left eye was, that the opaque substance visible in it was a dense and circumscribed opacity of the cornea. A more careful inspection, however, convinced me that the body was detached from the cornea and contained in the anterior aqueous chamber, being neither more nor less than the remains of a partially absorbed crystalline lens.

The circumstances of the case clearly show that the patient must, previous to the attack of pain, have been affected with cataract in the left eye. The gradual failure of vision, the observation made by a neighbour as to the actual existence of cataract, and the present condition of the other eye, in which this disease can be seen in an incipient stage, are all confirmatory of this opinion.

Assuming, then, the existence of cataract, we know that the opaque lens could only have reached the anterior aqueous chamber by passing through the pupil, an aperture sufficiently dilatable to admit of its transmission. In support of the probability of this accident having occurred, let us look again at the further circumstances of the case. The patient is suddenly attacked with severe pain of the eye, which gradually declines, vision begins to return, and continues slowly to improve; and at the end of a year and a half the patient is able to distinguish large objects with the eye which was formerly blind, and the nucleus of the crystalline lens is found lying in the anterior chamber. With these facts before us I think we cannot doubt, but that from some cause or other which does not appear, the opaque lens escaped from its capsule, passed into the anterior chamber, there gave rise to inflammatory action, and then gradually underwent absorption, vision returning as the opaque body diminished in size, and thus opened anew a free passage for the admission of light.

Displacement of the crystalline lens from its natural connections, whether by violence or the more tardy operation of inflammatory action within the eyeball, is not a very rare occurrence. I have witnessed repeated instances of it, and many more are recorded in the works of ophthalmologists both at home and abroad. But in the above case the displacement appears to have been spontaneous, without the intervention of any of the usual exciting causes. The patient was not conscious of ever having received any injury to the eye, nor is there any evidence of inflammatory action having preceded the passage of the lens through the pupil. It is true that cataract existed previous to this occurrence, and that disease is not unfrequently attended with symptoms of inflammatory action within the eyeball. The question, therefore, may be raised, whether the morbid process which produced opacity of the lens may not have extended also to the other structures within the globe, causing undue fluidity of the vitreous humour, and loosening the attachments by which the lens is maintained *in situ*. Admitting this to have been the case, we can understand how any unusual pressure or movement communicated to the eyeball, as by the sudden contraction of its own muscles, might suffice to effect the displacement of the lens.

It is remarkable that this transposition should have occurred during sleep, when the pupil is contracted, and very violent muscular disturbance unlikely to occur. It is possible, however, that the lens may have been in the anterior chamber for some hours previous to the attack of pain.

Another question which invests this case with additional interest, and at the same time does not appear to admit of easy solution, is this, what has become of the capsule of the lens? There is no trace of it in the anterior chamber, nor can I detect any remains of it in its natural position. Had it continued to invest the lens after its displacement, absorption would not have gone on as we see it has; and even if the lens had shrivelled up within its capsule, as sometimes occurs in such cases, we should probably have found some remains of the latter, which is much less obedient to the action of the absorbents than the body which it contains; but there is none. Again, supposing the capsule to have given way, and permitted the escape of the lens, we ought to find some evidence of its existence behind the pupil, but there is none there either; and assuming that the capsule was there, and invisible, because transparent, the use of the lighted candle would infallibly detect its presence, if even a fragment remained capable of reflecting an image. But no image is reflected, and hence we may conclude with certainty, that the capsule no longer occupies its natural position.

The only recorded case which I can find at all resembling the one detailed above is related by Von Ammon of Dresden, in the first volume of his Ophthalmological Journal. It occurred in the person of a lady, a patient of his own. In early life she had received a penetrating wound of the left eye, which was, in consequence, always rather weak, and some years afterwards the crystalline lens was found in the anterior chamber. It gave rise to repeated attacks of inflammation and pain, which were subdued by appropriate means; the lens gradually diminished in size, and at the end of five months was reduced to one-third of its original bulk. The pupil was free, but vision had not returned.

## ART. II.—*Observations on the Nature, Causes, and Treatment of Yellow Fever.* By JOHN IMRAY of Dominica, M. D., Licentiate of the Royal College of Surgeons of Edinburgh.

THE investigation of epidemic disease under the manifold forms which it assumes in different countries, constitutes one of the most important departments of medical science. The history of such diseases must ever be of great interest when we consider the vast numbers of our race that are continually destroyed by them, and that their causes and nature are in so many instances hidden in obscurity.

Of diseases of this character there is probably none that has attracted a greater share of attention, or on which more has been written, than the yellow fever of the West Indies, with what result the great differences of opinion among medical writers sufficiently attest; for it must be admitted, that where such discrepancies exist as to the origin, nature, and treatment of a disease, the truth has not yet been fully arrived at. That just conclusions, however, may be come to with regard to the nature of any epidemic disease, it should be viewed under the various phases which it presents, as seen under different circumstances, and in different climates; and we should avoid as much as possible drawing general inferences from limited observations. The importance, therefore, of recording the history of epidemics as they appear at different periods and places will be at once acknowledged, for though such histories in themselves may present nothing new or of striking interest, still an addition is made to the store of facts, by the accumulation of which some great and important truths may ultimately be brought to light.

With this intention the following observations on the yellow fever, as it lately prevailed in the island of Dominica, have been drawn up.

In the 142d Number of this Journal appeared an account of an epidemic fever that prevailed in this island during the year 1838. From the end of that year, when the yellow fever ceased to exist in the colony, till 1841, all classes of the community enjoyed a remarkable immunity from disease; indeed, the island might have claimed a comparison in point of salubrity with any part of Europe. The European troops during the above period were more than usually healthy; the garrison hospital at Morne Bruce being at one time shut up,—an event of very rare occurrence.

This happy exemption from the dire scourge of the West Indies was unfortunately of short duration. In June 1841 it again burst out, under circumstances very much resembling its first appearance in 1838, with the exception that the country was previously healthy; no fever of a remittent or intermittent character having preceded it, as happened in the epidemic of 1838. As in that epidemic, the first cases occurred on board a vessel lying at anchor in the roads of Roseau, and hence arose the general belief among the inhabitants that the disease was imported; an impression which continues up to the present time. The circumstances, however, when viewed impartially, lead to a different conclusion. Indeed, it may now scarcely be considered necessary to enter into any discussion on the question of contagion, the non-contagious nature of yellow fever being so generally admitted by those who are competent to give an opinion on the subject. It is certainly, however, greatly to be desired that this opinion should be more generally entertained by the public, as much unnecessary panic would thereby be prevented.

The brig Funchal, Captain Clift, arrived at this port on the 13th June 1841. She had left Newfoundland about three months previous with a cargo of salt fish, touched at Barbadoes, and from thence proceeded to St Pierre, Martinique, where her cargo was landed. After remaining about a fortnight there, she left for this island, to load with sugar. Some of the men were slightly indisposed at Martinique, otherwise the crew had been perfectly healthy. A few days after her arrival I was requested to visit two of the sailors, who were ill with fever. The symptoms were headach, complained of chiefly at the temples, with great heat about the head. General temperature not much increased, nor much acceleration of the pulse; pains in the back and lower extremities; coated tongue; thirst; and scanty urine. In one of these cases blood-letting was practised, purgatives administered, and cold applied to the head. The other was not bled, but was otherwise similarly treated. Both recovered.

On the 24th June two more men were taken ill, the symptoms, though of the same character as the first two cases, being much more severe. The one, a middle-aged and previously healthy man, presented the following symptoms. Great prostration of strength; heat and pain of head, confined chiefly to the temples; intense pain in the loins, stretching down the lower extremities; hot dry skin; pulse quick, but not full; tongue slightly coated; great thirst; bowels have been regular; the eye heavy, and the countenance expressive of anguish. Twenty-five ounces of blood were taken from the arm, which produced faintness. This relieved the head symptoms, but made no impression on the pain in the loins. During the day he was taken on shore; calomel, purgatives, and saline medicines were administered. Second day, the heat of skin was diminished; the headach not complained of; but the pain in the back and lower extremities was unabated, with great restlessness and anxiety. Blood was again taken from the arm, but did not appear to afford any relief. During the next two days the pulse had fallen to the natural standard, or below; heat of surface natural; no headach; tongue slightly coated and moist. The intense pain in the back continued with some tenderness in the right hypochondriac region. He was incessantly rolling about in bed and moaning. The treatment need not be detailed. The stomach now became irritable, the fluid vomited being rather dark-coloured. The vomiting continued, and at length all doubt as to the nature of the malady was removed by the appearance of the dreaded black vomit. The skin had also assumed a livid yellow colour; the intellectual faculties now became disturbed; bleeding from the gums appeared, and he died, convulsed, after a week's illness. The pulse retained the same slow steady beat till within a few hours of death.

The other sailor taken ill at the same time, whose symptoms were not so severe, was also blooded to faintness. He vomited a quantity of bilious matter, and copious perspiration broke out over the surface generally. He recovered, but remained long in a very debilitated state. The symptoms of the next case were apparently so mild that the poor fellow thought nothing of them. He was taken ill in the evening, but told no one till next morning, when he came on deck and complained that he could not see distinctly, but did not feel very ill, and only had a little headach. He was blooded from the arm, &c. On the third day he died comatose, with bleeding from the gums and yellow surface.

Such were the leading phenomena presented by the first two cases on board the Funchal. In the course of the next three weeks one man was attacked after another, till the disease had passed through the whole crew, the mate excepted. A sailor who was shipped from on shore was also affected. The attack was not preceded by rigors, and only in one or two instances was there any feeling of chilliness experienced; the fever came on at once with severe pain of head, confined chiefly to the temples and occiput, and general heat of surface. The course of the disease was never in any case marked by remissions. The above are the particulars of the fever as it first appeared among the crew of the Funchal. The number attacked was thirteen, of whom three died. One of these was convalescent; but being left on deck imperfectly protected from the weather, and having little attention otherwise, a relapse was the consequence, which ended fatally.

The epidemic now made its appearance in Roseau. The first case was that of Lieutenant R., Fort-Adjutant, who was taken ill on the 24th July and died on the 29th; all the symptoms being those of a case of well-marked yellow fever. The Honourable J.

L., a native of the island, but resident in England the greater part of his life, was the next victim to the disease. This gentleman, whose death was much regretted, and a serious loss to the colony, was attacked on the 27th July, and died August 1.

It is hardly necessary to enter into a minute description of the symptoms and course of the fever, as it would only be a repetition of the details given of the epidemic of 1838, from which in no particular did it differ.

The commencement of the attack was without rigors, seldom even with chilliness, and usually very sudden, with great prostration of strength, intense lumbar pains extending along the thighs, extreme restlessness and anxiety. The headach was of a peculiar character, differing from this symptom as usually met with in the common fevers of the country. The pain, generally very severe, was confined in most cases to the temples and occiput; sometimes the forehead was affected, but pain was rarely experienced in the coronal region. On the second, third, or fourth day, came the subsidence of all the acute symptoms, freedom from pain, cool skin, slow pulse, yellowness of surface, followed in a longer or shorter period by bleeding from the mucous surfaces, the deadly black vomit, or the cerebral and nervous symptoms of the epidemic of 1838, equally certain forerunners of death.

This was the usual course which the disease ran, though there were cases which presented somewhat different symptoms. With a few exceptions, the fever was confined to the European population, the symptoms being modified, and in general rendered milder by a residence of some years in the colony. Yet could the term remitting in no ways be applied to the fever, for even in the mildest cases the peculiar and distinctive symptoms of the epidemic were always present. One or two cases of common intermittent occurred, but they were not looked upon with any apprehension, and yielded to the usual treatment.

The character of the epidemic may probably be best shown both in its milder and more severe forms by the relation of a few cases.

The following are the symptoms of the first two cases occurring on shore already alluded to.

Lieutenant R., Fort-Adjutant, (statement as given by Assistant Surgeon Millingen,) aged about 26; about three years in the West Indies; attacked on the 24th July; great excitement; full bounding pulse; coated tongue; eyes much injected, heavy; severe headach, confined principally to the forehead; intolerance of light. Practised venesection, with apparent good effect; copious evacuations and profuse sweats early procured. Excitement still continued till 27th, when all pain subsided; skin cool. Quinine administered. Remained in the same state till afternoon of the 28th, when strangeness in his manners and wildness about the eyes were observed; pulse became more frequent and weaker; incoherent talk. Stimulants administered. Eight P. M., delirious; violent convulsions. Five P. M. 29th, died.

Honourable J. L., taken ill July 27th. Hot dry skin; great heat and pain of head; eyes suffused; stomach irritable; tongue foul; breath fetid; thirst; great restlessness; insomnia; quick full pulse. Bowels open from medicine taken last night.

Blooded to faintness, with slight relief.

*Calomelanos et Pulv. Jacob. ver.*, with saline draughts, ordered at intervals; warm bath; cold to the head.

28th. Very bad night; no sleep; no perspiration; febrile symptoms continued; extreme restlessness. The pulse being still full and quick, blood was again taken from the arm with but little relief. Continue the powders and draughts; a dozen leeches applied to the head with good effect; continue cold applications to the head, the hair being removed.

29th. Passed a bad night; wandered a little; surface much cooler; pulse slower; headach, in lesser degree, remains; irritability of stomach, and thirst increased; still extremely restless; breath offensive. Blister to the nape of the neck, and sinapism over the stomach; calomel, combined with a little opium, at intervals. During the next thirty-six hours the surface was cool; extremities rather cold and clammy at times; headach gone; pulse between seventy and eighty, and he considered himself recovering; still the intense thirst and gastric irritability remained; he could not rest a moment in one position. His manner was hurried, and he appeared anxious to be considered convalescent. Blister over the epigastric region; opiates to allay irritability of stomach; and stimulants occasionally to support the powers of life, now beginning to sink. On the forenoon of the 21st he retained his nourishment, and everything given. In the afternoon a slight falter in the speech was noticed. This increased so rapidly, that in an hour or two he could scarcely be understood; intellectual faculties disturbed. These symptoms continued to get worse, with occasional convulsions, till two o'clock next day, when he expired.

William Crawford, European, aged 20; about two years in the country; dark complexioned; clerk in a store. Has been complaining for some days. Bowels out of order. Visited August 5; skin warm; pulse quick; pain and heat of head; thirst; restlessness; tongue slightly coated; pain in the loins. Blooded to faintness; headach relieved; foot-bath; cold applications to the head. ℞ *Calomelanos* grs. iv.; *Pulv. Jalap.*, grs. vi. *M.*, with a tablespoonful of saline mixture every third hour, till the bowels are freely opened, and perspiration come on.

6th. Febrile symptoms nearly gone; perspired freely during the night; head still warm, though he does not complain of headach; tongue clean. Continue cold to the head; bowels kept open by small doses of calomel.

7th. Seems doing well; no fever; skin cool; pulse natural, but still a little heat about the forehead; says he thinks he might get out of bed, he feels so much better. Ordered to remain quiet. Continue same treatment.

8th. Slept none; talked at times incoherently during the night; wishes to leave his bed. Skin cool; pulse slow; bowels open; gastric irritability; vomits every thing taken. Sinapism to the epigastric region; calomel, four grains every fourth hour. A wine glassful of a solution of chloride of soda between each dose of the calomel.

9th. No sleep; talked wildly all night; wants to get out of bed; continually saying his cousin has arrived from St Lucia, and that he wants to speak to him; pulse 76; head and surface generally cool; bleeding from the nose; vomited none since the sinapism was applied; bowels confined. Seidlitz powders ordered; nourishment frequently; blister to the nape of the neck.

Evening. Is getting worse; constantly moving about in bed, and catching hold of the sheet with his fingers; laughs, and says he is quite well; gets out of bed if left a moment alone. Saline effervescent draughts every fourth hour, alternated with the solution of chloride of soda. Discontinue calomel.

10th. No sleep. Says he has arrived in London this morning, but really can't account for the voyage being made in so short a time; wants to dress, in order to go out to visit some of his friends in London; very restless, constantly moving his hands about; tongue inclined to redness, moist; pulse weaker; surface and head cool. Continue effervescent draughts and solution of chloride of soda. He has once or twice got out of bed, and tried to reach the window. Not to be left a moment alone.

Midnight. He is asleep for the first time for four days. To be kept very quiet. When awake continue the medicine.

11th. Has slept several hours; talks much more rationally; inquired for the other clerks; a little bleeding from the nose. Is now aware, from the pain, that a blister has been applied to his neck. Continue medicine.

Evening. Passed a quiet day; slept a good deal; takes his nourishment well; bowels open. Discontinue solution of chloride of soda; let it be again given if bleeding from the nose come on.

12th. Slept nearly the whole night; quiet and collected, but at times speaks a little wildly. Seidlitz powder.

14th. Convalescent.

Recovery rarely takes place when the symptoms which this case presented are met with. The sleep on the night of the 10th was evidently critical. The gentleman, whose clerk he was, afterwards informed me that he sat by his bed side fanning him for an hour or two; and that then he began to appear drowsy, and sleep afterwards followed. It was thought that the chloride of soda might have had some influence in arresting the bleeding from the nose, as it seemed to be checked after its administration. In the case of another clerk, (J. Crampton), who had profuse hemorrhage from the gums, it was exhibited in considerable quantity, but failed to have any beneficial effect. The stage of excitement with Crampton was similar to the case of Crawford, and had subsided, leaving him perfectly free from pain, with yellow surface, and bleeding from the gums. This was of so intractable a nature, that the blood continued to flow from his mouth almost in a stream, in spite of every means used to arrest it both internally and externally. A vessel happened to arrive with ice on board, some of which was procured. A lump of it was ordered to be kept in the mouth till it melted, and immediately replaced by another. Happily for the patient, the hemorrhage was quickly checked by the action of the cold, and he recovered.

The next case is given to show the form of the fever in a patient whose system had been acclimated by a residence of some years in the country.

August 26. Visited J. N. Gordon, aged 30; generally healthy; spare habit; says he was taken ill last night with fever.

*Symptoms.*—Great heat and pain across the forehead, shooting to the occiput; little heat or pain in other parts of the head; pained and sore all over, particularly in the loins and lower extremities; not much febrile heat; pulse little above the natural beat; weak; very restless; bowels confined; urine scanty.

Hair removed from the head; cold affusion, and cold applications after; repeat the affusion if desired by the patient. *Calomelanos* gr. x.; *Ext. Colocynth. C.* grs. viii.; *in pil. duas, statim sum.*, followed by Seidlitz powders every two hours, till the bowels are freely acted on. Warm bath.

Evening. Pespiration after the bath which relieved the pain considerably; less heat of head; dull heavy pain remains, felt particularly when he moves. Has taken the medicine ordered, but the bowels have not yet been sufficiently opened. Cupped on the nape of the neck to five ounces; feels the head lighter since. ℞ *Calomel.* gr. viij.; *Pulv. Jacob.* gr. vj.; *M.* Seidlitz powders every third hour after.

27th. Passed a tolerable night; pulse 80; skin cool and moist; very little headach; free alvine evacuations. Wishes the cold water to be poured over his head frequently. *Rep. Pulv. Jacob. et Calomelas.* Seidlitz powder after.

Evening. Continues improving. Says his gums are sore.

28th. Better; headach nearly gone; strength much reduced; mouth affected by the calomel.

30th. Convalescent.

This case presented the usual symptoms of the fever in the first stage; there was no rigor at the commencement, nor any return of the febrile action when it had once subsided. A degree of debility followed, which would not have been looked for after an attack of common remittent fever of like duration, especially as general blood-letting was not practised.

The following case presents some points of considerable interest.

Mrs D., European, aged about 27; eight months in the island; in the ninth month of her first pregnancy; weakly constitution; spare habit; subject to an asthmatic affection, which has been alleviated since her arrival in a hot climate. Attacked with the prevailing epidemic on the night of July 30th; no chilliness experienced. Symptoms in the morning were great prostration of strength; general increase of heat; great pain across the forehead and at the occiput, with excessive heat in those situations; intolerance of light; pain in the loins and lower part of the abdomen; weak, soft pulse, increased in quickness; thirst; is very anxious and afraid she will not recover, particularly in her present state, alluding to her pregnancy. The treatment consisted in keeping the bowels open with small doses of Henry's calcined magnesia, which generally agreed well with her; saline draughts at intervals. Removal of the hair from the head; cold applications and cold affusion frequently; leeches were twice applied to the forehead. Hot foot-bath twice a-day. On the fourth day the febrile excitement began to subside; pain and heat of head nearly gone; skin cool; pulse weak, but slower; less thirst. The uneasy feeling in the lower part of the abdomen continued without pain in the back; surface yellow.

Fifth day, (August 4th.) Strength greatly reduced; pain in the abdomen; intellect undisturbed. She is now very anxious about the pain, and says if her confinement come on she does not think she will have strength to go through with it.

August 5th. Restless night. Pains now more severe, returning at intervals; surface cool; free from heat or pain of head; pulse slower and stronger. It was now intimated to her that her confinement was near at hand. She was rather desponding, fancying that her strength would fail. The pains became more frequent and severe, and labour advanced favourably and in the usual manner. She spoke very little, and only when questions were asked, but seemed rational. About 2 o'clock A. M. of the 6th she was delivered of a girl. Fearing that hæmorrhage might supervene the placenta was carefully watched, the uterus acted readily, and in three quarters of an hour the placenta was expelled. Having ascertained that the uterus was well contracted, a bandage was carefully applied. The pulse still retained considerable strength and regularity of beat, but the poor patient was so much exhausted that when spoken to she could scarcely articulate. After administering some warm wine and water the room was left for about a quarter of an hour, the nurse being ordered to watch the patient. On returning to the chamber I found her lying in the same position, the countenance deadly pale, and sensibility almost gone; the pulse could just be felt to flutter at the wrist. As she had continued perfectly tranquil the stupid old nurse had not observed the change. It was instantly ascertained that the sinking had not arisen from hæmorrhage, the uterus being well contracted. Though insensible, she fortunately retained the power of deglutition. Hot wine and water, the first stimulus at hand, was given immediately. Having ordered some hot brandy and water, and then arrow root to be prepared, I remained at her bedside, and continued every quarter of an hour to administer some stimulus, either the hot brandy and water, or arrow root with brandy or wine, anxiously watching the uterus, which, on one or two occasions, became rather flabby, but contracted instantly under pressure with the hand. She was now only kept alive by the continued exhibition of stimuli, the pulse rising a little after each dose. She was perfectly insensible to every thing going on around her. If roused and asked how she is, says she does not know, and falls back into a state of unconsciousness.

6th. Noon. Is lying in the same insensible state; countenance pale, yellow and bloodless; breathing scarcely perceptible; pulse can just be felt at the wrist. Gives the same answer when roused and asked how she feels. Is taking brandy in arrow root every half hour, and occasionally wine.

7th. Has continued nearly the same since yesterday. Unless some strong stimulus is given at short intervals the pulse immediately fails. A pint decanter of brandy has been taken since yesterday, besides wine at different times. Surface very yellow; pulse rather better.

8th. Has rallied a good deal since yesterday; sensibility returning. Asks where she is, and if she has been confined, of which she has no recollection whatever, and begins to inquire about her infant. The stimulus cannot be dispensed with for more than one hour at a time. An enema administered; bowels acted on; lochia continues; some coagula expelled. For the next three or four days she continued slowly recovering. The brandy could not be discontinued for several days. She repeatedly expressed her utter unconsciousness of having been delivered, and was very anxious about her child. Her recovery was very slow, and she did not regain her usual strength for many months after, and had to remove to a mountain situation for change of air.

This case is interesting from the fact of the patient rallying from a state of collapse so extreme and long continued. The complication of pregnancy at so advanced a period, with the exhaustion arising from delivery, lessened materially the chances of recovery from a disease in itself so dangerous. Two instances of pregnant women being attacked occurred in 1838, both terminated fatally. It seemed in the case of Mrs D., that nature became utterly exhausted, after accomplishing the process of parturition; and without doubt the patient must have soon expired, but for the constant and large exhibition of powerful stimuli.

Under such circumstances wines of different kinds or brandy appear to be the most manageable as well as most easily administered stimuli.

In a medico-legal point of view the case is not without interest. I believe the examples on record of unconscious delivery are not very numerous. In this instance the patient had not the slightest recollection of having given birth to a child. Consciousness, no doubt, existed at the commencement of labour; but from her unwillingness to speak towards the conclusion, and the little pain she appeared to suffer, especially seeing it was a first child, but little sensibility could have remained. Be that as it may, whatever impressions may have been made at the time, they were completely obliterated during the period of insensibility through which she passed.

It is not necessary to occupy space by further details of cases, as the nature of the disease will be sufficiently clear from those already given. About the beginning of September the epidemic began to subside in Roseau, and before the end of that month had entirely disappeared. The first case occurred among the troops on the 11th August, and the fever continued its ravages in the garrison up to the period of the removal of the troops to Barbadoes on the 27th November.

Morne Bruce, the hill on which the garrison is situated, is scarcely half a mile in a straight line from Roseau. It rises about 400 feet above the level of the sea, and is freely exposed on every side to the breeze. The symptoms and course of the fever in the garrison were the same as in 1838, and the mortality in proportion to the number attacked was nearly as great. Assistant-Surgeon Millingen 92d, in describing the usual phenomena of the malady, says, that in every instance there was yellowness of skin, the yellow tinge appearing about the second day. When the patient delayed coming to hospital the skin was sometimes quite cool, generally moist, or rather clammy. In one case there was no pain except in the elbow, resembling a case of rheumatism; yet the symptoms became most malignant, and accompanied with profuse vomiting.

The total number of cases in the garrison amounted to 204, of whom died 55. In this statement is included 34 cases of relapse; the proportion of deaths among whom was 10.

In civil practice, including the cases of Messrs M'Coll and Sisson, the numbers were as follows,—

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| Number of sailors attacked, . | 25. | Of these died, 5 |
| Number of cases in Roseau and the vicinity, | 19. | Of these died, 5 |
| Total, | 44 | 10 |

With the exception of the sailor on board the Funchal, I am not aware of any instance of relapse.

I may here take notice of a circumstance mentioned to me by Assistant-Surgeon Millingen.* Lieutenant Campbell arrived from St Lucia while the fever was raging; he was attacked and nearly died; and a dog that he brought with him became sick a few days after it had been in the garrison, and died with a discharge from the stomach resembling black vomit.

*Treatment.*—The first consideration that usually offers itself in the treatment of tropical febrile diseases is the propriety or impropriety of blood-letting, especially if there be much general excitement. Both opinions and practice vary much as regards the abstraction of blood in yellow fever. In some countries we find it generally practised, and attended with good effects. In others, though attempted at the commencement of an epidemic, it has been found necessary to abandon this mode of treatment. From the interesting memoirs of Dr Rufz, reviewed by Dr Cheron in the Gazette Medicale,† it appears that blood-letting was generally resorted to in Martinique, and the favourable results that followed this practice proved its advantage. In this island, on the contrary, though fairly tried by the civil practitioners, as well as military medical officers, it was found as a general plan of treatment not to succeed. Assistant-Surgeon Millingen says, that in very few cases was bleeding admissible. It only tended to bring on sooner that debility which supervened so early, and diminished the prospect of the patient's recovery. From this diversity of opinions and practice in the treatment of yellow fever, we can only conclude, that the symptoms in appearance may be much the same; yet, in different countries, situations, and seasons, different remedial measures are required, and that no one plan of treatment has yet been discovered that can be considered applicable in every instance. We have an example of this in the two islands of Martinique and Dominica, both mountainous, similar in geological formation, with the same temperature and climate, and separated by a channel scarcely thirty miles in breadth; yet we find the epidemic yellow fever in the one island successfully treated by blood-letting, while, in the other, the same treatment was followed by opposite effects.

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* This gentleman, who had charge of the garrison during the epidemic, was most zealous and indefatigable, his life nearly falling a sacrifice to his exertions.

† Nos. 37, 40, 42, 43, 46, 48.

The general plan of treatment varied but little from that adopted in the former epidemic. The bowels were freely acted on by purgatives, warm-baths were employed according to the symptoms, and saline medicines were administered. When the surface was hot and dry, free perspiration was procured if possible. Local symptoms were treated by topical blood-letting, blisters, &c. The application of cold to the head, particularly by affusion, was as useful in controlling increased cerebral action, as pleasing to the feelings of the patient. Calomel was administered chiefly as a purgative, and was not given in large and repeated doses with the purpose of affecting the system, having formerly been found rather injurious than useful when exhibited with this view. Mr Millingen used the chloride of soda in the military hospital with happy effects, where bleeding from the gums had taken place. It was administered in injections as well as by the mouth. In some cases it was necessary to give opiates when there was much gastric irritation. The sulphate of quinine was sometimes exhibited when the stage of excitement had subsided, but it did not appear to exert any influence in preventing the usual train of symptoms which preceded death. In the few cases of intermittent that were met with, this medicine was used with its ordinary curative effects.

More cases with bleeding from the gums recovered than in the epidemic of 1838; but there was no instance of recovery after black vomit had appeared.

From the fact of inflammatory action or congestion of the mucous membrane of the stomach almost always existing in greater or less degree, it may be argued that the exhibition of stimuli can rarely be advantageous, and, indeed, it is only in some cases that this mode of treatment is indicated. When we meet with a case presenting cold extremities, cold clammy surface, sinking pulse, and all the symptoms of the near and certain approach of dissolution, are we to allow the patient to sink when yet one chance remains, merely from the dread of irritating the digestive mucous surface? There cannot be a doubt that many patients have been, as it were, snatched from the grave by the prompt and decisive use of stimuli, for, in such cases, the quantity administered is not so much to be looked to, as the effects produced.

Though the proportion of deaths must always be great with (it must be confessed) the imperfect knowledge we at present have of the treatment of yellow fever; yet the efficacy of early remedial measures was clearly shown in the military hospital by the much greater mortality that took place among those, who came to hospital, when the disease was far advanced, or the first stage over. Indeed I am convinced from my own observation, as well as the opinion of Assistant-Surgeon Millingen, that the mortality among the troops would have been much lessened, could the soldiers have been induced to apply for assistance when the first symptoms of the fever were felt. It is only at the commencement that treatment can in general be of much avail. If there is high febrile action it can be repressed, local affections may be removed, and other indications fulfilled. But when the surface is cool, the pulse slow, all increased vascular action subsided, and all pain gone, the patient may still be in extreme danger. Yet what is to be done? It is here that science fails us, and all our resources are exhausted. A quivering of the muscles of the face is observed; a few clots of blood escape from the gums; mucus mixed with dark flakes is coughed up. These phenomena, with others over which he has no control, the medical attendant knows full well, are the almost certain precursors of death, and he has the inexpressible pain of witnessing the march of an incurable disease, and of being looked up to by the patient and his friends for aid, when, alas! he can afford none.

The morbid appearances were the same in every respect as those observed in the epidemic of 1838, and therefore need not again be minutely described. The yellow livid colour of the body became deepened after death, and decomposition advanced rapidly. The mucous membrane of the stomach presented patches of inflammation or congestion of greater or lesser intensity, and was sometimes thickened. The stomach in every instance examined contained the black vomit. Assistant-Surgeon Millingen in one case collected as much as fourteen ounces of this fluid. The gamboge yellow liver was invariably found. Yet it has been proved by Dr Rufz of Martinique that this condition of the liver is not distinctive of yellow fever, as supposed by Louis, for M. Rufz has given details of cases where the patients died with the usual symptoms of yellow fever, and, on examination, this peculiar change in the liver had not taken place.

The appearances presented on examination of the head were chiefly congestion of the sinuses, increased vascularity of the substance of the brain and of its membranes. The latter were in some cases thickened, and occasionally there was serous effusion in the ventricles and at the base of the brain.

*Post mortem* examinations have done but little towards unfolding the real nature of yellow fever. Indeed the more the disease is studied, the deeper becomes the impression that the poison acts chiefly on the vital fluids. It would seem in many cases as if the blood were that part of the system from which the vital principle began first to be withdrawn. It need not be repeated that the morbid changes observed in the stomach and brain, at least such as are appreciable to our senses, can scarcely be considered as accounting satisfactorily for the symptoms and rapid course of the fever. The gastric and cerebral symptoms are probably only consequences or concomitants, for sometimes there is little or no irritability of stomach, though the black vomit is almost always found in that organ. Many cases, likewise, terminate fatally without the presence of such disorder of the cerebral functions as can in any way account for death.

The origin of yellow fever still remains a *questio vexata*, and requires much elucidation before any decisive opinion can be formed on the subject. While the disease altogether disappeared from this colony, in the neighbouring Island of Martinique, the troops, as well as the inhabitants generally, continued to suffer greatly, as appears from the Memoirs of Dr Rufz.

It could not be said that the causes of the epidemic still continued to exist in this island, and only ceased to act because there was no material on which the poison could exert its baneful influence; for the European troops were more than once changed, yet not a single instance of yellow fever occurred either in the garrison, among the civilian inhabitants, or the shipping, from 1838 to June 1841. Moreover, were this the case, Europeans, if susceptible, would invariably be attacked as they arrived in the West Indies. Now we find that in some colonies a long period of years passes on, and no case of the disease is met with, while the influx of Europeans is still going on. But so soon as the causes become developed, then do the natives of cold climates suffer; and if others arrive while the epidemic influence is in operation, the risk of attack is very great. At the same time it is perfectly true, that yellow fever occasionally disappears in consequence of the absence of predisposed individuals, while the causes linger in the country, and only manifest themselves on the arrival of Europeans, or of others who have become highly susceptible.

Neither could the outbreak of the epidemic be ascribed to any sensible peculiarity in the season; for the weather during the first part of the year was marked by nothing unusual, and from July to November was very fine. In a register I kept of the weather it is stated, that during the latter months "thunder storms were not very frequent. In Roseau and the surrounding country the rains were not quite so heavy as usual. The wind for the most part has blown from the usual direction, south-east, but seldom with any violence. Frequent shocks of earthquakes occurred in the northern part of the island; as many as fifteen or sixteen were felt in one night."

The following table gives the mean temperature while the epidemic prevailed.

Self-registering Thermometer in the Shade.

| Month. | Maximum. Mean. | Minimum. Mean. | Highest at any time. | Lowest at any time. |
|---|---|---|---|---|
| July, . | 85½ | 75 | 87½ | 72 |
| August, . | 85½ | 75½ | 87 | 71 |
| September, | 85½ | 76 | 87 | 74 |
| October, . | 86 | 76 | 89 | 72 |
| November, | 85 | 75½ | 87 | 72 |
| December, | 82 | 74 | 86 | 71 |

In the article already alluded to in the Gazette Medicale, Dr Chervin gives it as his opinion, that the paludal and yellow fever are identical in their nature and cause. In this belief he is joined by Dr Rufz of Martinique. M. Chervin remarks, "The facts now recorded, according to the testimony of Messrs Rufz, Dutroulau, Souty, and Catel, tend evidently to prove that yellow fever belongs to the family of intermittent and remittent fevers, of which it is merely the highest degree." After citing many facts and authorities to establish this opinion, M. Chervin again observes, "Can we say that these three types, intermittent, remittent, and continuous, proceed each from a peculiar cause. Assuredly not. They proceed from one and the same cause, viz. *malaria*, though in different degrees of concentration, as is shown by the different phases through which the fever passes during the course of the epidemic." The opinion here stated of the absolute identity in cause of yellow fever, and the remittent and intermittent types, must carry with it great weight, coming from so high an authority as Chervin, and supported as it is by the conviction of a physician of the talent and experience of Dr Rufz.

Probable as this opinion may be, it does not, however, appear that the position is yet clearly made out. Several difficulties stand in the way, which, with the knowledge we at present possess on the subject, are not easy of removal.

If it be assumed that the epidemic febrile disorder usually recognised by the name of yellow fever is identical in cause with the endemic periodic fevers of these islands, we may naturally conclude that where those diseases prevail with greatest frequency—where marsh miasm most abounds—there ought yellow fever most frequently to show itself, and occur in its most virulent and malignant forms. How stand the facts? Let us compare, for instance, the islands of Dominica and St Lucia with Barbadoes. The two former composed of masses of lofty mountains, intersected by deep ravines and valleys, and covered in every direction with forest and brushwood, are only under partial cultivation and abound in miasmata. There are situations in both these islands so inimical to the European constitution that a residence even for a short time, is almost with certainty followed by an attack of intermittent or remittent fever, as, for instance, Prince Rupert's of this island and the Roseau valley of St Lucia. Periodic fevers are of constant occurrence in these islands at all seasons, though prevailing more at one season than another.

Barbadoes, on the other hand, presents comparatively a level surface, almost entirely under beautiful cultivation. Here are no lofty mountains, dense forests, or extensive morasses, and the consequence is, as might be expected, that periodic fevers are of rare occurrence. Indeed, the island of Barbadoes is so free from these disorders, that persons labouring under intractable intermittents repair thither for recovery. But do we find this colony equally free from yellow fever? The history of the island says the reverse. The troops have repeatedly and severely suffered from epidemic outbreaks of this malady, and the mortality among the civilian inhabitants has at times been very great. So far back as 1752, Hillary, in his work on the Diseases of Barbadoes, says, "I must observe that intermitting fevers, especially tertians and quartans, are very rarely or never seen in this island now, unless they are brought hither from some of the Leeward islands, or some other places which are less cultivated, and not yet cleared of the woods, where intermitting fevers are said to be much more frequent, and are often attended with obstruction of the glands, &c." The island was far, however, from having any such exemption from yellow fever. The same writer's delineation of the disease corresponds exactly with the form in which it is now seen. He says, "It does not appear from the most accurate observations of the variations of the weather, or any difference of the seasons which I have been able to make for several years past, that the fever is in any way caused or much influenced by them: for I have seen it at all seasons of the year, in the coolest as well as in the hottest time of the year, except that I have always observed that the symptoms of this, (as well as most other fevers,) are generally more acute, and the fever usually higher in a very hot season, especially if it was preceded by warm moist weather, than it usually is when more cool." It does not appear from the statistical report of the sickness, &c. among the troops in the West Indies, that Barbadoes has much advantage at the present day over many of the other islands, so far as this type of fever is concerned, though healthier in other respects.

With regard to the influence of season or atmospheric changes, the statement given by M. Rufz coincides with the remarks of the writer above quoted. He says, "Now whether the thermometer was high or low, whether it rained or was fine weather, hot or cool, yellow fever always prevailed with the same intensity, without the character of the seasons appearing in any way to influence its progress."

Season and situation, on the contrary, have much to do with the production of intermittent and remittent fevers. In many islands the healthiness of a situation as regards the common endemic diseases is determined by its position. In this island, for instance, though there are some districts very unhealthy, yet the climate of many localities is as salubrious as delightful. Again, if we look at the effects of season, we observe that the autumnal months are marked by the frequent occurrence of intermittent and remittent fevers, and generally of the worst form, while they are comparatively rare from December to April, and are milder and more manageable.

The autumn of 1843 was remarkable for the wide prevalence of remittent fever in this island. The symptoms presented nothing very unusual, except that the type was rather of a lower character than common, and attended with much debility. This epidemic, (for it may be so called from the number of persons attacked,) is alluded to, for the purpose of showing, that the morbid influences acted chiefly on the natives and old residents, and that the Europeans newly arrived escaped with comparative impunity.

I take the following notes from my register of the weather 1843.

"Sept.—The remittent fever has continued during last month, but now begins to disappear. The type has not been altered. In the garrison some cases have occurred. They have not been numerous, nor have the symptoms been at all severe. There has been no fatal case. It is worthy of remark that this fever has attacked many of the natives and old residents who had been well inured to the climate, and had scarcely ever suffered from fever before; while the lately arrived and the troops, always likely to be affected if epidemic influence exists, have been much less the subjects of the disease. How can this be reconciled with the opinion, that the causes of tropical fevers are identical, and only differ in degree? It is to be supposed that those who have been long in the country, and who are thoroughly climatised, are least susceptible of the usual morbific agencies, and that if any cause of disease exists sufficient to produce fever in such constitutions, the same causes will act with tenfold force, and give rise to symptoms much more grave in the unacclimated, or those who have been but a short time within the tropics. This has not been the case, however, with the epidemic with which the island has been visited during the last three or four months. Though in general mild in its character, it has attacked the native and the old resident, while the troops and others but a short time in the country have been lightly passed over.

"It appears more likely that the causes of fever differ, and are not identical. That at one time there is a peculiarity in the epidemic constitution which gives a virulent and fatal character to fever when the European is attacked, while the native and old resident escape; and at other times the latter are affected by causes of disease which do not act with like intensity on the former.

"October.—There have been several cases of the remittent fever. The troops have been attacked in greater numbers, but no case has occurred offering serious symptoms: the attack was usually terminated after the second or third paroxysm, leaving considerable debility."

By December the fever had entirely left the island. In civil practice three fatal cases occurred. Two of these were Europeans; but death took place under peculiar circumstances. Both were living in the country, at a distance from medical assistance, which could not be procured in time to be of any service.

Many examples might be adduced to show that yellow fever may prevail with great malignancy where the intermitting types are scarcely known.

The troops have of late years suffered much at the island of St Christophers from this deadly fever. Nor from all that I could learn of the matter can anything be more perplexing or unaccountable than the outbreak and persistance of the epidemic in the garrison. Brimstone Hill, on which the garrison is placed, rises 700 feet above the level of the sea, and is not surrounded by any morasses or thick wooded land. The statistical report says "there are no lakes, pools, or marshes, and the rain pours at once into the sea through deep ravines and clefts." Yet to this dry, rocky hill, where intermitting fevers but rarely are met with, did the yellow fever cling so pertinaciously, and produce a mortality so great that it has been necessary to withdraw the white troops entirely from the island.

The peculiarity of attaching itself to particular localities which under other circumstances may be healthy, is a well-known characteristic of yellow fever. During the late epidemic here, the Government house afforded an instance of this nature; scarcely a European slept there that escaped an attack. The Lieutenant-Governor, Major (now Colonel) Hort, was one of the sufferers, and his lady fell a victim to the malady. In Martinique this peculiarity of the poison harbouring in certain localities was also noticed. Dr Rufz observes, "Once developed in certain localities, the disease appeared to these to adhere, and made there several victims. For some houses it showed a predilection. Such was, among others, the convent of the Ladies of St Joseph."

Equally inexplicable is the manner in which the morbid agency manifests itself on ship-board, and adheres to the vessel till she reach the cold latitudes, or all on board susceptible have been attacked. Foul holds, decaying wood, &c. have been assigned as causes; but are there no vessels in the West Indies with foul holds and decaying wood on board, where yellow fever never makes its appearance? Such concurrent circumstances may possibly assist in developing the poison, of whatever nature it may be, but cannot in themselves be the causes, otherwise, wherever they existed, there ought yellow fever always to show itself, provided the temperature was sufficiently high. We do not hear of intermittent fevers attacking vessels or localities in this manner, neither do intermittents or remittents necessarily precede, accompany, or follow epidemic yellow fever, which might naturally be expected to happen always were the causes identical. It is true that the epidemic of this island in 1838 was preceded by intermittents; but in 1841 it burst out suddenly, without giving any such intimation of its approach, and ceased without the prevalence of intermittent fever.

It has been already remarked that general conclusions should not be drawn from limited observation, from witnessing any disease only in one country. Were we, however, to form an opinion from the history of yellow fever as it has prevailed in Dominica, it would be difficult to come to any other decision than that the causes differ essentially from those in which the common endemic disorders originate. We find the disease prevailing in 1821; then the long period of sixteen years elapses, during which time the country is free from it. It breaks out and is very fatal in 1838. Three healthy years intervene, from 1838 to 1841, and again it makes its appearance. The character of the epidemic also being so different from the common endemic fevers of the country. It could not be called periodic, for almost in every instance it marches on with a steady pace, either to a fatal issue or recovery. We have in general the absence of rigors, a stage of excitement of greater or less intensity, the singular subsidence of the increased vascular action, the absence of pain, cool skin, cerebral and nervous symptoms, black vomit, and death. This is very unlike the usual progress of a case of endemic remittent fever. The character of the delirium even appears to differ. In our remittent fevers we have a rapid and unconnected succession of ideas, over which the patient can exert no control. In the delirium of yellow fever there are usually some fixed ideas deeply impressed on the mind, which the patient has the power of retaining before him, or which, apart from consciousness or the will, remain fixed in the mind. Reasoning from these impressions, the patient comes to correct conclusions. He imagines, for example, that some of his relatives at a distance are ill, and that he must visit them without delay. He issues all the necessary orders preparatory to a journey, and if permitted will leave his bed and proceed to dress. Sometimes there is a remarkable state of the intellectual faculties, where the patient, though seemingly in perfect possession of his reasoning powers, will not believe that he is dangerously ill, even when the symptoms are mortal, nay, when the black vomit itself has appeared, and though when in health he may have been well acquainted with the usual course of the malady. An instance of this nature occurs to me in the case of Lieutenant G., 92d, who, when the black vomit was pouring from his mouth, said, "It was nothing, only a little biliousness." Not many hours after, he expired.

There can be no doubt that diseases may nearly resemble each other, and yet differ essentially in their nature and cause. Now, it may be asked, are we justified in concluding that intermittent and yellow fever are identical in nature and cause, only differing in degree, because the intermittent type is prevalent after, or exists previous to or during epidemic yellow fever? May not intermittent and yellow fever prevail at the same time, and yet different morbid agencies have to do with the causation? else why should the latter prevail where the former is scarcely known?

Again, may not yellow fever at times present even a remittent form, and yet not be identical with paludal fevers?

Supposing for a moment that both maladies arise from different causes, may not these causes co-exist and act together? May not an individual be attacked with the intermittent type, and the presence of the poison of yellow fever in the system give a peculiarity to the attack, and alter essentially the symptoms? Can any two febrile diseases be more unlike than a case of common intermittent and one of malignant yellow fever? In the long catalogue of diseases that afflict mankind, is there any parallel example of a disease identical in nature and cause occurring in forms so widely different, and under circumstances so diverse?

We know that yellow fever is met with only in certain parts of the world, and certain localities; that a certain degree of heat, though not the cause, is absolutely necessary to give activity to the poison. But why in the same place, and under circumstances that are apparently similar, it should at one time rage with frightful mortality, and at another the inhabitants be remarkably healthy; why it should be absent from a country for many years, and then break out, without the possibility of assigning a satisfactory cause, are among the many difficulties connected with yellow fever, that yet remain to be cleared up. But surely there must be some new cause in operation, when these terrible epidemics burst on a country when least expected, or some unusual change must take place in the common morbid agencies, to enable them to act with such intense malignancy on the human frame.

Dr Craigie, in his masterly treatise on yellow fever,* (which, indeed, comprehends everything of any consequence known on the subject,) after carefully passing in review the many causes to which the disease has been attributed, says, " It appears that yellow fever becomes epidemic neither in consequence of intense temperature alone, nor humidity alone, nor filth, nor the presence of foul docks and wharves, nor desiccated marshes, nor decomposed cabbages or coffee, or mangroves, nor even charred ship holds; but a certain condition of the atmosphere, which occurs at very uncertain intervals, and of the recurrence of which the circumstances now enumerated are indications."

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* Elements of the Practice of Physic, vol. i. p. 236.

Further than this, it does not appear that our present knowledge will allow us to go. We are not yet in possession of data sufficiently numerous and certain to warrant any positive conclusion as to the sources from whence emanated the poison that gives rise to the yellow fever of the West Indies.

I should not again have considered it necessary to revert to the subject of contagion, were it not that we have lately had a most striking and convincing proof in this island, that yellow fever is not disseminated by any contagious principle. If the former fevers were considered by many as having been imported, though on no sufficient grounds, an example has now been given of the actual and undoubted introduction of yellow fever by the troops, without the subsequent occurrence of a single case among the civilian inhabitants.

On the 13th December 1844 the detachment of the 46th regiment in garrison was replaced by a company of the 71st from Grenada, that island, at the time of their departure, being healthy. On the 27th December another company of the 71st was disembarked from the mail steamer, and marched to Morne Bruce,—the passage by steam from Grenada being about thirty hours. Shortly after the first company left Grenada yellow fever broke out in the garrison there, and was prevailing at the time the second company left. Two men were taken away ill, who, on landing, were carried to the garrison hospital. The symptoms were stated by Dr Stewart, the officer in charge of the garrison, to be at first apparently mild. Both, however, died with black vomit, and all the symptoms of yellow fever, the one on the 30th, the other on the 31st December.

The ravages committed by the epidemic of 1841 being fresh in the recollection of the inhabitants, much alarm was created when the rumour went abroad, that yellow fever had been imported into the island from Grenada, and that the dreadful mortality of the former epidemic was again impending over the unhappy colony. The island at the time being very healthy, and no epidemic constitution existing, I was not under any apprehension of the disease extending.

After several days had elapsed new cases were admitted to the hospital, and the disease continued to prevail with great mortality, being, however, confined, with two exceptions, to the company by whom it was imported. During this time there was no interruption to the usual intercourse between the town and garrison. The non-contagious nature of the fever was rendered still more certain by the removal of the troops from Morne Bruce to a level spot of ground in the environs, or, it may rather be said, within the town of Roseau, and no precaution whatever was taken to prevent constant communication with the inhabitants.

After the troops had been encamped in this situation for several days, an order arrived from head-quarters for the instant removal of the affected company to Barbadoes. The symptoms, so far as I could ascertain, were in every instance those of yellow fever. The virulence of the disease, while it lasted, was shown by the great mortality. Thirty-seven cases occurred, of which number thirteen died. The ratio of mortality, in proportion to the number of cases, was greater than in 1841. I am not aware of the treatment pursued by Dr Stewart, nor had I an opportunity of witnessing any of the *post mortem* inspections, but I was informed that black vomit was found in the stomach in every instance. I may also mention that the steamer which landed the last company of the 71st conveyed to Antigua a detachment of the same regiment. Among the soldiers several deaths afterwards took place from yellow fever.

The circumstances above selected may be viewed in the light of an interesting experiment, inasmuch as it proves that malignant yellow fever may be introduced into a country, and not extend beyond the parties coming from the affected locality. We may infer, that the epidemic influence having existed when the troops left Grenada, the poison must have been there imbibed, and manifested its effects on their arrival in this island. Of the company that first landed, two men were attacked with the fever. One of these men had been in close confinement from the time of his arrival. Had the disease been contagious, it is hardly possible that a whole company could have thus easily escaped. We also observed that the change from one island to another does not always prevent the development of yellow fever when the system has been impregnated by the poison, which may remain latent for some length of time. There cannot be a doubt, however, of the great advantages in general derived from change of position. Whenever or wherever yellow fever breaks out among the troops, removal, if practicable, from the affected locality, is the first measure that should be thought of, and is, I believe, now very generally adopted by the medical officers in the West Indies. After the troops were removed from Morne Bruce to Roseau, I believe few, if any cases were admitted to hospital. Whether this arose from the change, or in the natural course of the epidemic, is, in the above instance, difficult to decide. The ground where the troops were encamped cannot, under ordinary circumstances, be considered healthy, being level and low lying, and in wet weather almost a swamp; yet when yellow fever is raging, it appears perfectly justifiable to remove the troops to an unhealthy situation, provided no other is available.

In Martinique and Guadeloupe, the French government has established convalescent stations at a considerable elevation in the interior, which has been found to answer admirably, nor does there appear any reason why the same example should not be followed in this island.

When a reasonable prospect exists, and means are within reach of saving the lives of our gallant soldiers, expense ought not surely to admit of a moment's consideration. But even in a pecuniary point of view, the establishment of a convalescent station in the interior would probably be a saving to Government, if we calculate the amount that each soldier costs on his arrival in the West Indies, and the sum that would be saved could the progress of an epidemic be stayed on its first outbreak.

Morne Desmoulin may be considered the most eligible situation for a convalescent station in this island. It rises above Morne Bruce towards the south-east, and is scarcely more than two miles from the coast. Its elevation may be about 1500 feet above the level of the sea. During the last war it was occupied as a military position, but has long been abandoned. The ground, however, still belongs to Government. The height is certainly not above the range of yellow fever in other countries; but from inquiries I have made, this disease has never been known in the quarter, even when much more populous than it is at present. The whole district is considered one of the healthiest in the island. A gentleman has lately cut a very good cart road to his estate in this part of the island, which leads within a few hundred yards of the summit of the mountain. Difficulty of transport, one of the greatest objections to the occupation of a mountain position by the troops in this rugged and inaccessible island, is thus obviated. There is a spring of water, also, at no great distance, though on a somewhat lower level.

The subject is evidently one that merits the consideration of the authorities.

## ART. III.—*Note on the Niger Expedition.* By Dr M'CORMAC, Belfast. May 1845.

I LOOKED on with interest not devoid of melancholy, while the proceedings touching the Niger expedition were going on; for I was assured that of those who went a large proportion would never return. A residence of some eight or ten months on the coast, and a connection still kept up with some near relatives there, have often caused me to turn attention to the subject, and led me to draw up a few remarks.

I was about six weeks at Sierra Leone under circumstances of full exposure, before I was seized with the local remittent. On its invasion the prickly heat (*lichen tropicus*) and copious perspiration were immediately replaced by a dry burning skin, great oppression, and headach. The remissions were irregular. I was conscious of my situation, but could perceive a tendency to wander, which, nevertheless, I was able to hold in check.

After the first, I experienced other subsequent attacks, which reduced me so much that it was singular how I survived. Exposure to the night air, an accidental contusion, or even any sudden violent effort served to bring on the disease. In the intervals I was so exhausted that a walk down the streets of Freetown would induce excessive acceleration of the pulse. After being attacked up the river, I recollect having to be carried on board the canoe in which I returned to the colony. In the vessel in which I made the voyage home, as well as subsequently in England, I had violent attacks of tertian fever.

Of individuals whom I saw labouring under the disease, some were delirious and raving; many plunged in stupor and unconsciousness. Others, however, went through all the phases of the disease, whether to death or recovery, without any mental disturbance whatever. I never witnessed black vomit, nor did cases with yellow skin or icterus prevail while I was in the colony. African remittent and yellow fever, so named, are in fact but one disorder, functional not organic, and exclusively the result of MALARIA generated by the combined action of heat and moisture on a rank deciduous vegetation.

It will be conceded, treat tropical remittent as we may, that the mortality is very great, nor do I think we ever shall be much more successful, so far as mere curative measures are concerned. By preparing the constitution, however, and with certain precautions, I think we may insure a milder attack, and even in many cases evade it altogether.

It is matter of notoriety, that persons who have lived long in a tropical climate, are thereby seasoned as it were, and become, almost equally with the natives, exempt from remittent fever. It is one of the ordinary conditions of this immunity that it should be purchased by prior attacks of fever, but it is not insuperable. I have heard of several persons and known others, who had become acclimated without previous fever. It was said, for example, of Sir Charles M'Carthy, that, up to the period of his unhappy death in the Ashantee war, he had never been unwell. He was a corpulent though active man, and practised no restrictions in the way of living.

In the event of another Niger expedition, then, persons should, if possible, be engaged, say at Sierra Leone or elsewhere on the coast, who had spent some time in the country. If such could not be procured, we should at least select individuals of regular habits, and preferably those who had previously been on the coast. These should have the command of the expedition; and as to the working hands, I would have them, with few exceptions, Croomen, in short blacks. Croomen are usually preferable to other negroes, inasmuch as being intelligent, well-conducted, and laborious, they are for the most part acquainted with English, European usages, and the working of ships. Indeed, I look forward to the day in which instructed black men will be considered fully competent to the task of African discovery and African enlightenment.

Of 158 negroes employed in the Niger expedition, only 11 it appears were attacked with fever, from which they all recovered. Whereas of 145 whites, 130 contracted fever, and 40 perished; 15 only escaping the complaint. Hence it is obvious that negroes should "lift and lay," keep watch at night, cut wood, go on watering parties, cook, launch, and hoist in the boats, row, heave the anchor, make and shorten sail, in fine perform every act involving considerable physical effort. It is not, I think, too much to say that, if 300 blacks, with a dozen or twenty acclimated whites to head them, had been employed on the Niger expedition, every soul of them might have come away safe. In place of this a number of unseasoned individuals rush to a locality where they incur hardly less risk than if they had to storm a battery. And such result must ever ensue from inattention to the physical constitution of European man, and the well-known operation of the African climate. We reject the hardy African, faithful and eager to be employed, inured as he is to his burning climate and oozy shores, and substitute inexperienced Europeans who are sure to die. Unless we expect a miracle of nature in our behalf these important principles should ever be kept in view.

If, notwithstanding, raw hands are still employed, the next best thing is to season them at as little cost of life as possible. Let negroes be still employed for all heavy work, let the decks be provided with awnings, and permit no unnecessary exposure by day, and, if possible, none whatever by night. Let every one breakfast before coming on deck in the morning. Let the greatest attention be paid to the bowels, which, if neglected, are very apt to become constipated; and let the diet both on the voyage to the coast and afterwards be light, sparing, and within the healthy appetite. Spirituous and vinous drinks, with tobacco, if not discontinued, should be employed with extreme moderation. Night exposure, wettings, excesses in women or wine, are almost certain to entail fever, and those who are unable to practise self-restraint have certainly little business in an expedition to the coast of Africa.

The gist of these precautions is obvious. By avoiding all exciting causes, very many sources of fever will be cut off, and by moderate gratification of the appetites, fever, when it does occur, will be attended with a less violent reaction, and consequently with less danger. As for the complaint, when it ensues, I would apply leeches to the temples and epigastrium, venesection in robust new comers, free purging, with antimonials, diluents, and cold or tepid sponging. In many cases an emetic, covering the patient well up, so as if possible to induce sweating, has to my knowledge often removed the complaint at its outset. Fear, it is commonly observed, by predisposing people to the disease, renders the issue more uncertain. During convalescence it is important to be cautious in gratifying the appetite, usually rather keen; nor is it less so to avoid premature exposure and physical effort, since a relapse, often fatal, is thereby readily induced.

It is likely that, with great care and attention, the human frame might in many, perhaps most instances, be so gradually modified as to bring the European constitution in accordance with the African climate. It is certain that such a change is often realized, though it be not so easy to say in what it consists. So far as I have observed, however, the blood becomes thinner and less florid; the muscular tissue more flaccid; and the whole system less excitable in old residenters than in persons recently arrived from Europe. The ordinary process of seasoning is too often attended with disease and death. But if attacks of fever can only be warded off by great temperance and moderation; by the disuse, or very guarded use of stimuli; by never going out before the morning meal; by avoiding as much as possible exposure to the sun, and more especially to the night air, we may hope with continued prudence to escape the disease altogether. As it is, several escape African fever altogether, and with the precautions I have named the numbers would greatly increase. In fact, the human frame appears to possess the property of gradually assimilating itself to the operation of certain animal and vegetable poisons, as in the case under discussion, and in the instance of typhous fever. In Africa it is matter of notoriety that white women, by their greater temperance and seclusion, oftener escape than men.

The dry season, so far as the depth of water in rivers may answer, is the most favourable for conducting operations in Africa. Though not free from risk, for Governor Denham died of fever during the dry season, it is certainly more salubrious than during the period of the rains, when the barometer falls and the air becomes surcharged with moisture, and when hurricanes, though of short duration, blow. During the rains, also, heat is most oppressive, and the perspiration, in place of being carried off by the atmosphere, clings to the enfeebled frame.

It appears from commemorate and local evidence, that the coast and river outlets generally are less healthy than the elevated interior country; it is therefore much to be regretted that so much time was lost by the expedition in ascending the delta of the Niger. Ten days, in place of forty-eight or even thirty-six hours, were spent in this pestilent region. With fast iron steamers of shallow draught, screw propelled, one would suppose the distance 220 miles, might have been passed in a couple days at the most. There should have been no delay that could be helped, whether in ascending the river or in transacting the ulterior business of the expedition. With fast vessels as now constructed, the recesses of the Niger might be visited and abandoned, and that with a proportionately limited mortality, within a very few days. Delays are proverbially dangerous, but delays in the delta of the Niger are death. There was no conceivable plea for them. The delta was an uninhabited waste confessedly abounding with the materials of human destruction.

I would suggest in the event of another expedition, that prepared fuel should be taken on board steamers from England, the store to be replenished if needful from steamers outside the bar. The service of cutting green wood, sickly even for negroes, is truly dangerous as respects whites, and a further source of inexpedient delay.

It was observed during the Niger expedition that the stokers and engineers were the last to contract fever, and then only, it would almost seem, because the fires were blown out. That fires afford a potent protection against malaria, I have long observed, and I always recommended them to my friends at Sierra Leone. Fires, therefore, should be maintained in the cabins day and night with prepared fuel; or an artificial atmosphere might be introduced by means of tubes passing through the boilers or other source of heat, then cooled in pipes passing under the vessel, and lastly suffered to escape into the cabins through sponges moistened by means of a simple apparatus, with a very dilute mineral acid. If the unacclimated portion of an expedition would submit to temporary isolation in cabins thus arranged, I am persuaded they might evade the destructive influence of the malaria altogether.

During the recent expedition the members, even the medical gentlemen, went repeatedly ashore, and it is stated that some of the villages which they visited were flooded, as well as the paths leading to them, and that the adventurers had to wade through stinking mud and other filth. There could be no surer receipt for contracting fever. Every needless exposure by night and by day should be stringently avoided, since it can only add to sickness and death.

The idea of a model farm on the Niger is very good, but it could only be carried out by gangs of negroes, with perhaps the addition of a few seasoned whites. With such an arrangement, and the further assistance, or even the exclusive superintendence of intelligent black men educated in Europe, a model farm and school might become a nucleus of civilization and the means of immeasurable good in Central Africa.

*Belfast, May* 19, 1845.

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## ART. IV.—*Medical Notes on Syria; or Practical Observations on the Diseases there treated during a residence of thirteen months, including remarks on the Country, its Climate, People, Resources, and an Account of the Plague as it occurred at Bairout in* 1841. By EBENEZER ROBERTSON, Lic. R. C. S. E., Surgeon, Royal Navy, and Medical Officer attached to the British Staff and Ordnance Detachments serving in the Expedition to Syria in 1840 and 1841. In a Letter to Sir W. BURNETT, Kt., M. D. (Continued from Vol. lxii. p. 351.)

*The Plague. Prophylactic Measures.*—The prophylactic measures may be divided into two—the public or general—the particular or private—or, in other words, into those regulations established by a country or countries for the preservation of the health of the people at large, and into those adopted by individuals or families for their own safety during the existence of an epidemic like this. Under the first head are included all those forms and rules which exist under the head of "Quarantine Regulations," to which, for full and ample details, we would refer. In reference further to these, we would merely say, that they, during our residence in the country, were performed in the most disgraceful manner; and those measures which are usually believed to be salutary, were in the hands of the sanitory officers converted into a great annoyance; and whilst, by their appearance of strict vigilance, they pretended to afford protection to the country, they admitted disease of every description among a people lulled to security by their formal and strict array of observances. One fact illustrative of this we would here mention,—considering one sufficient to remove the doubts of any who augur better of such a class of beings. Deputy-Inspector Robertson having had occasion to visit the detachment of Sappers, &c. at Mount Carmel, left Bairout, and on horseback proceeded to, and returned from the encampment, having only remained a few days in it. *En route* he avoided all and every thing and person. On arriving at the cordon surrounding Bairout, he was informed that he must undergo quarantine for ten days. A house was provided for him outside the walls; the upper part he alone occupied; the lower was inhabited by a native family. A few days only had elapsed, when Dr Robertson found that in the very room beneath his own there was a case of plague. The person had been upwards of ten days ill, and had been known to, and visited by, the medical officers of the sanitory establishment.

The lazaretto is a large isolated building, about two miles from the town, built on a promontory, which last has its three sides washed by the sea. It is variously divided; into apartments for contagious or suspicious cases, stores for merchandise, and rooms for individuals who have to undergo quarantine. In relation to the first, they are badly constructed for the purpose, being small and without means of ventilation, damp, and unfit to resist the influences of the weather. They are supplied with only one door and window looking towards the west, without any opposed apertures, thereby favouring the collection and concentration of fœtid exhalations, arising from many sick being indiscriminately huddled together, without the slightest attention to cleanliness, as regards either the chambers or the individuals. As to the stores for merchandise and the other apartments, they, in very few instances, are water-tight; and the last are perfectly unfitted for any class above the rank of those whose persons, crawling with vermin and laden with the filth of years, have scarcely such hovels for their homes. But bad as this system is, it has one good point. They permit strangers to have either a house or rooms in which to undergo their quarantine, and place over them a guardian. The treatment in the Lazaretto was repulsive to humanity in an extreme degree; torn from their families and hurriedly carried off, the inmates were crowded into filthy rooms, and for days sometimes, left without food, water, or medicine, the last, however, when supplied, being always highly charged for. The doctors, assuming all that pomp which ignorance and unrestrained self-esteem generally give, had their patients, in many cases scarcely living, carried to the doors or windows; and whilst in one hand they held their coat, for fear of even touching a neighbour, they with the other pushed against the delicate swelling parts with a baton armed with iron, and eagerly inquired, "Bugia?" (does it pain?) This picture I shall terminate with an extract from the report made by the captain of the lazaretto to the inspector of quarantine on the 24th May. "The plague-sick load the administration and government with masses of maledictions, and not without reason; for it is shocking and altogether inhuman on the part of the former not to have sent their medicines, &c. Many of those who were doing well are actually worse from want of assistance. The attendant (l'infirmièr) knows not what to do,—and in the last extreme, after waiting till all hope has vanished, has made a pommade of soap and oil to apply to the wounds." The captain who faithfully made this and other reports too true to be listened to, was; subsequent to the one from which we have made an extract, expelled the situation.

The second part, or particular quarantine, embraces two distinct heads; *first*, those rules adopted by a governor of a town or district to endeavour to prevent the disease from entering it, to detect the occurrence of it within the district, and to obviate as much as possible any circumstance which might tend to diffuse it; and, *secondly*, those observances followed by the inhabitants on the occurrence of the disease in their town or district. We shall offer a few remarks on both. Under the former we have the isolation of the particular town, village, or district by a cordon, preventing all individuals from entering, until such time as they shall have submitted to a surveillance of so many days, to be regulated by the attested certificate of the officer commanding the district whence they came,—the dividing the included district into certain portions, to which medical officers are to be appointed, and in which medical inspections are to take place, more or less frequently, as the more or less particular urgency of the case may demand,—the causing to be reported, within a certain number of hours, every case of illness, under the pain of a heavy penalty or punishment—so as in suspicious cases, by isolation, to prevent any intercourse or contact till the case sufficiently declare itself; or, in true cases of the disease, by instant removal, and causing all compromised with the person or persons so affected to be submitted to a strict observation of so many days.

Next to these come the proper fumigation and cleansing of those houses in which cases have occurred, with the destruction by fire of all articles of apparel made use of by the sick or dead; the sick, when removed, to be placed in capacious apartments, which, whilst well aired and ventilated, should have everything removed from them, save what is essentially and absolutely necessary for the sick, and the floors well sprinkled from time to time with some of the powerfully disinfecting solutions.

Lastly, must be enforced the isolation of a particular district of the town, with which no communication is on any account to be permitted, by causing the evacuation of houses, if required to perfect the line of separation; the immediate destruction of all excretions and bodies by quicklime, &c.; the due cleansing of streets, court-yards, common sewers, and habitations of the lower classes, huddled together like animals, with whom they frequently are associated, &c. which last, although they come more directly under the head of police, should always have the attention of the superintending medical officer, who is the only *fit* person to direct and judge of what is necessary.

In relation to the latter, the better inhabitants, or those who can afford it, upon the occurrence of the disease in the district, immediate neighbourhood, or town, instantly confine themselves with their families to their houses, and avoid contact with all and every thing save them and what immediately belongs to them; they submit every thing received from the bazaars to certain processes, without undergoing which, they consider them not only dangerous, but capable of propagating the disease. Beef, vegetables, and money are immersed in acidulated water; bread, &c. are subjected to heat after having been put into boiling water; papers, silks, cotton goods, &c. are subjected to fumigation; and all other articles, under the head of susceptibles, too numerous to mention, are carefully avoided till such time as each, according to its quality or kind, has been submitted to one of the above-mentioned supposed disinfecting agents; whereas, on the other hand, so very strong is their belief in the "non-susceptibles," that they will not only take from the hand of another any thing having the character of being so; but we have frequently interchanged with native families in rigid quarantine, the customary Eastern civilities of changing pipes, drinking coffee, &c.

What we have thus briefly described we consider imperatively called for; for, although we do not believe that the disease is possessed of properties so virulently contagious, or has such subtile powers, yet what we have just detailed serve a beneficial end in favouring isolation, and preventing the propagation of the disease by contact. But before we can cherish a hope that this disease can be either modified or banished from the country, civilization, with its attendant blessings, must take rapid and gigantic strides; draining, &c. must be had recourse to; the fortifications of their towns levelled with the ground; their thickly crowded and densely populated villages destroyed and made to ornament an extended country, &c. But before one single step can be looked for in this country, they must have some government better than that of the Ottoman, which, instead of striving to elevate it, or better the condition of its inhabitants, looks to self-aggrandizement alone, and therefore can only tend to sink it and its inhabitants still deeper in the slough of intestinal disorder.

*Treatment.*—In relation to this department of the subject, we have to lament that our peculiar position prevented us from taking advantage of all the opportunities presented for trying the full effect of medicinal agents in this disease. A few cases, however, did occur, two of which we subjoin, illustrative in the first instance, of a simple case of plague, and in the second, of the more severe, attended with extensive charbon, and then add a few additional remarks.

Case 1. A girl, aged seven, was, during the night, seized with sickness and vomiting of what was described to be a very bilious matter. It recurred frequently towards morning. When we first saw her, she was then in a very low state, depressed, with weak tremulous pulse, complaining of tenderness at epigastrium, with dull headach, and pain in the back, loins, and lower extremities. The heart's action was labouring; the breathing rather deep, considerable intervals existing between the acts of inspiration, which were performed with considerable muscular exertion; inclination to be drowsy, with aversion to answer any questions; the tongue foul and bloodless; the surface cold. A powder of eight grains of calomel was instantly exhibited, followed two hours afterwards by a small dose of castor oil. Both were retained. She was then immersed in a warm water bath, having mustard mingled with the water; and thereafter the surface was well rubbed with coarse towels. Towards mid-day the medicine operated, the dejections of a highly bilious character, pained the anus on passage.

*Vespere.*—Has had vomiting during the day twice, is now very low, and there appears to be considerable oppression in the chest. To have a little camphor mixture with carbonate of ammonia every hour. During the night reaction took place, and she then became very restless, and began to complain of severe pain in the head, accompanied by increase of the epigastric tenderness towards morning. Lancinating pains were said to be felt in the axilla and groin of the right side; but nothing was then either visible to the eye or sensible to the touch, which last, moreover, did not excite pain. The tongue had become dry, red round the edges, and the centre coated; skin hot and dry; pulse sharp and quick; respiration short and hurried; eye suffused; forehead very warm, with considerable throbbing of temporal artery. Solution of the nitrate of potassa, with a very minute dose of tartrate of antimony, was exhibited hourly throughout the day, and the cold evaporating lotion kept constantly applied to the forehead. Towards evening, her state generally was much the same, but a few of the symptoms had become aggravated. The tongue dry, was retracted to the posterior part of the mouth; the epigastric tenderness was very considerable, and there was great increase of the restlessness and general uneasiness. At midnight the epigastric tenderness, with violent ineffectual retching, became so severe, as to demand the application of eighteen leeches. The bleeding was encouraged, and great relief was experienced in both the symptoms by their application. About daylight she became much more composed, and gentle diaphoresis broke out on the thorax and upper extremities, but not profusely. A few small doses of calomel and opium were now exhibited at short intervals throughout the day. The consequent depression was great, with inclination to drowsiness; the pulse quick, weak, and almost flowing, was compressible on the slightest pressure; the tongue moist, though deeply coated; the centre brown, but its margin studded with numerous red points. A mixture of camphor and quinine was exhibited every second hour, and in the intermediate periods brandy and water, weak. Under this treatment, persevered in, and assisted by other restorative means, she rallied, and on the eighth day,* on examining the axilla and groin, a bubo soft to the touch was found in each. They both opened after a few days, discharging at first a thin glairy matter, which gradually assumed a healthy appearance. Under the influence of liberal diet and warm applications to the parts, she soon became convalescent; the buboes healed kindly, attention being paid to cleanliness.

CASE 2. Antoon Ayub was first seen on the 9th of May, having then been ill for nine or ten days. On being visited, we found him in a typhoid state, with an extensive carbuncle involving one side of the neck, extending from the acromion to the lobe of the ear; his eye dull and lifeless; tongue dry, parched, and shrivelled in his mouth; teeth and lips covered with sordes; skin and head described as warm; urine very high coloured and sparing in quantity. The following is the account then received of his previous state. He was stated to have been seized with symptoms such as we have described under the head of mild plague; and, on the second day of his illness, a small dusky pimple presented itself on the side of the neck. For the two or three subsequent days he did not complain much. The pimple after that increased rapidly, and he became insensible, and has been in the same state ever since; the black (asphat) swelling always increasing. As the edges by their appearance seemed still favourable to the extension of the insidiously creeping inflammatory action, and as it appeared to us, on considering all the bearings of the case, that the only chance, and that a faint one, of rallying him, depended on bringing the system as rapidly as possible, and at all hazard, under the influence of mercury, large doses, combined with camphor and quinine, (a combination we had previously found very useful in sloughing bubo, or suppuration attended with extreme debility,) were frequently administered; his intestine was unloaded by an enema, and a linseed cataplasm applied over the whole neck. On the 11th all the symptoms had increased for the worse. He could with difficulty be made merely to half open his eyelids, but could not respond. An ounce of the following mixture was exhibited every hour.

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* On examination, we have said, on the eighth day a bubo was found in both axilla and groin. At first. (being anxious to treat the disease), we denied it to be plague, and, by our handling, gave assurance to the rest of the family, all of whom. however, we kept separate. But after the girl had gone through the dangerous stages, the whole were then put under the inspection of a guardian.

℞. *Camphor.* ℈ij; *spirit. rectific.* ℥i; *sulphat. quinæ,* grs. xij; *acid. sulph. dilut.* ʒss; *aquæ O. M. Solve, colaque, &c.*

And the hot dressing, with cataplasms, applied to the neck, with a view of endeavouring to excite to healthy action the yet unaffected part of the neck. An enema was exhibited; sinapisms were applied to the calves of the legs and inner parts of the thighs; calomel was persevered in till the evening of the 12th, when he was seized with vomiting; and after having ejected a large quantity of offensive bilious matter, he appeared more easy and fell into a sleep, which at first was disturbed, but gradually became more and more placid. He continued so till morning, when, on awaking, it was found that intelligence had again dawned upon him. On being asked if he felt any pain, he answered by pointing to his mouth and shoulder, the latter presenting a healthy blush of inflammation, and in two or three places evidence of approaching separation were apparent. The same mixture was ordered to be continued, but every three hours only; a little weak wine and water for drink, and enemata twice a-day to relieve a very disagreeable sensation at neck of bladder. Opiates were administered at evening to relieve the stinging pain of the neck, and to endeavour to procure soft refreshing sleep.

After this favourable crisis had taken place, he gradually but slowly improved, now and then suffering an occasional relapse for several days, from some error or irregularity in diet, caused by the too often officious mistaken kindness of some friend or relative. The slough gradually separated, exposing the neck from the ear to the acromion, extending posteriorly to below the spine of scapula and *ligamentum nuchæ*, and anteriorly below clavicle, which last was perfectly denuded, and permitted a probe to be passed underneath it. The *platysma myoides* was entirely removed; the *sterno-mastoideus*, *trapezius*, and *omo-hyoideus* muscles completely dissected, showing a perfect denudation of all interfibral cellular tissue. This extensive granulating surface was immediately sprinkled with powder of rhubarb, having a small quantity of opium mingled with it, and was renewed whenever the other, which, with the purulent matter, formed a kind protecting cake or covering, was removed, or rather became thrown off. Under such treatment pursued for some time, and followed by the sulphate of zinc and other remedies, and assisted by nourishing diet, tonics, stimuli, and gentle exercise in the open air, the part entirely cicatrized, and about the middle of July he was so perfectly re-established as to be able to follow his usual mercantile occupations. The neck was approximated to the shoulders, but not to such an extent as we anticipated.

*Conclusions.*—Having now detailed the two preceding cases, we may be permitted to hazard the opinion that this disease is as amenable to remedial agents as any other with which the human race has been visited. That it should not be so, we can see no reason. But it requires a treatment varied and diversified in its three different stages; and no one line of treatment, or no one kind of remedies, can ever prove successful in a disease so very varied in the mildness and severity of its attacks,—so changing and changeable in its course, and that former experience must be made to bear on the various complications and moulded according to circumstances. In bringing this to a conclusion, we would remark, after carefully studying the symptoms and course of the disease, that the most probable means of affording relief appears to us, in *the first stage*, to endeavour to rouse the entire capillary tissue from its depressed and overpowered state by warm medicated baths and by diffusible stimuli; in *the second*, to control the state of reaction by the various contra-stimulants in use, to relieve local and urgent symptoms by local depletion, and those other remedies which naturally suggest themselves to every practitioner of some experience; and in the *third*, and during *convalescence*, to combat the depression by the various means in our power; to endeavour to bring the eruptions as speedily forward as possible, and when suppuration take place, to open the tumours as early as possible, obviate profuse suppuration by constitutional and local remedies, and ward off a debility, which oft proves fatal, (in Sidon, sixteen fell victims to it,) by liberal diet, and, if possible and practicable, by a removal to a more salubrious district. But before quitting this subject, we find there remains one point which particularly deserves notice,—it refers to the state of the alvine secretions. In the report kindly presented to us by Dr Guillardot of Sidon, he says that it is not an infrequent thing for the bowels to be costive, and that this costiveness ought not to be much desired to be removed; for he had seen many cases, where, from too great anxiety evinced in the exhibition of cathartics, hypercatharsis was induced, which all remedies administered failed to counteract. He mentions his own case, in which for nine days he had no alvine evacuation, and seems to think that no consequences detrimental to him arose from such a circumstance having existed. Of this, in the disease we now treat of, we have no experience; but from our experience in other diseases already treated of, we consider it a very important fact, and one which ought to be deeply impressed on the mind of every one whose medical duty may at a time place him in contact with a distemper so unmanageable.

During the existence of this disease, all fevers, febrile attacks, eruptions, wounds, &c. show that they, to a greater or less degree, are influenced by those local influences engendering the disease. One melancholy case out of many which we were called on to witness, and painfully illustrative of this fact, we shall shortly detail under the head of "intestinal abscess." We could add many more recorded in our notes, but we consider it unnecessary.

*Finally*, We believe the plague to be an exanthematous disease,—having a fever of a peculiar type, characterised by certain eruptions not to be mistaken or confounded; that either may exist without the other; that it has a local origin, may be propagated by infection or contagion, and that it is a disease for which remedial agents may be administered with the prospect of success.

*Bouton d'Aleppe, &c.*—Under the fourth head we place those affections peculiar to certain districts only, as the Pustule of Aleppo; the cutaneous affections of the mountain districts; the ulcerating elephantiasis and leprosy, so prevalent in the district around Jerusalem, &c.; but having only seen them, but never submitted any, save the first, to treatment, we shall not lengthen these medical notes by giving the opinions of others.

*Hernia.*—As already stated, this disease, although of frequent occurrence, is more particularly met with in the persons of the porters in the towns along the sea-coast. In some of them it attains a very large size indeed, conveying to the mind the idea of the whole contents of the abdomen being transferred to the scrotum.

The great frequency of this affection may, with justice, be referred to the relaxing influence of the climate on the system generally, assisted by the peculiar style of dress, which, whilst in man and woman it, as with a tight cincture, encircles the waist and upper part of the abdomen, leaves totally unsupported the lower parts, which are allowed to hang pendulous in the wide "brackee" they wear; by their habit of sitting cross-legged, thereby of itself engendering a degree of temperature and moisture, which, were other causes awanting, would of itself be sufficient to produce a laxity of parts favourable to the production of the affection on the slightest exertion. They use for the smaller kinds a rude truss, made in and brought from Constantinople; and for the larger, they have, in some cases, very original supports, whilst many use none at all; for being naturally and by climate indolent, the remaining quiet, which such a state demands, is attended with no inconvenience to them. Strangulation is very rare; but one case, as interesting in its detail and treatment as it was astonishing in its cure, we consider worthy of being brought before the notice of the medical public. The following is the account given by the individual through our interpreter.

A. B. a merchant of Tripoli, aged 24, of a plethoric habit of body and very lax fibre, (in the month of December 1840, 18 months prior to coming to consult me,) whilst employed in his magazines lifting bales of goods, experienced something give way about the lower part of the abdomen. A swelling came on, which in the evening and the day following was attended with considerable pain and redness. He was seized with vomiting. A native doctor, the only one procurable, was sent for, who, on carefully examining the tumour, declared it to be a bubo filled with purulent matter. He immediately proceeded to lay it open, when to his own astonishment and horror, no less to that of his unfortunate patient and friends, fæces alone came away. He became affrighted, and flying from the house, left the village and his patient to his fate. Enemata were exhibited by his friends, the bowels were acted on, and the vomiting gradually ceased; the part became black, and after a time sloughed away; the excrements continued to pass, and he remained in much the same state till shortly before we saw him, only keeping the part well cleansed, washing it frequently with warm water. Many haykims saw him, but the skill and ingenuity of each and all were equally baffled—all confessed their ignorance. At length it closed up. The Seraskier Pasha having passed shortly thereafter through the town, northward, the adventurous medical man attached to him was requested to visit him. He advised him to join them at their head-quarters in the North, and he would operate upon him—impressing on the unfortunate's mind that there "must be a glueing together of the intestines." This credulous individual had proceeded to Bairout, preparatory to embarking, and being domiciled with a friend, whose family we had frequently attended, was persuaded to consult us preparatory to proceeding further. After having had a full detail of the symptoms much in the same way as we have related them, and then submitting the individual to inspection, it was perfectly evident that what had been represented had taken place. We found about midway between the anterior superior spine of the ilium and the external abdominal ring the remains of a defined circular aperture with rounded edges, easily traced through the delicate livid cutaneous covering stretched across. He experienced no inconvenience so long as he remained quiet, or restricted his exercise to gentle exertion, and kept his bowels regular, which he had learned to do by small doses of castor oil; but there was pain experienced on making use of any exertion a little violent or severe, riding on horseback, or permitting his bowels to become constipated.

We advised him to return to Tripoli, to permit no one to interfere with him so long as it continued in the state in which it then was, and to give it gentle support by a soft pad and bandage, both of which we applied for him.

*Intestinal Abscess.*—It is not rarely that the medical practitioner is called upon, in this or other countries, to witness cases of abscess forming in the neighbourhood of the walls of the rectum; but it rarely is his duty to behold so fearful a form of this affection as we are about to describe,—"Abscess attended with extensive sloughing of the nates, perineum, scrotum, and præputium penis."

Although this peculiar form of abscess is said to be not frequent in Syria, we feel inclined to doubt the statement; *first,* because the native haykims have no knowledge of the disease; *secondly*, the practitioners whom we met in a subsequent case were not aware of such an affection, until convinced *oculis et cultello ;* and *lastly*, because, if it be a frequent disease, it occurs at that period when touch is no longer practised, but all and every thing avoided. If there be any seasons of the year in which it shows a preference to assume this severe form, we should fix upon that period during which those local influences engendering the plague, exert their malignant action on every disease or affection which may then arise; every fever assuming a character analogous to the low fever characterising Plague, and every wound or boil assuming an appearance similar to the eruptions characteristic of that disease. It was during such a season that we were eye-witnesses of two melancholy cases—one of which, being a faithful delineation of the disease from its commencement till death closed the scene, is subjoined, and will serve to illustrate the noxious influence of that climate.

A. B. staff-officer, shortly after his arrival in Syria, performed a fatiguing journey of several days' duration on horseback; and on his return to Bairout, December 1840, suffered from an attack of bilious diarrhœa, but attended with more than usual heat in the region of the rectum, with a tendency to pass the dejections convulsively. The immediate complaint was relieved by the exhibition of doses of calomel and opium combined with castor oil and warm fomentations. Frequently between the above month and that of February, he repeatedly experienced disagreeable sensations in the rectum, approaching to a burning pain, which was referred to hæmorrhoidal tumours, from which he had previously suffered. On the 20th of the last-named month he commenced a long and fatiguing journey over a wild and rude country, during which he frequently suffered very much, his pain sometimes amounting to agony. He rejoined us at Bairout on the 16th of March, comparatively well, having, before he started from Jappa, suffered a violent attack of intermittent fever. He complained, however, very much now of the lower gut, which he hoped would now disappear, as his horse exertions had terminated for a period. After a few days the system generally became considerably deranged, accompanied by an increase of those sensations, so frequently referred to, preventing him sitting save upon one side. There were general lassitude, weakness and pain in the loins and lower extremities. Calomel followed by senna draughts was exhibited with a view to correct the biliary derangement; warm fomentations with sedative applications were applied locally. But as yet nothing materially wrong was indicated by either the parts or the evacuations, which, with the urine, were such as are usually attendant upon such a derangement of the stomach and bowels as he then laboured under; but there was an irritability of temper and an anxiety of mind, as foreign to his usual affability and mildness, as they were incompatible with the derangement as yet obvious. He continued in much the same state till the latter part of the month, deriving very little benefit from the various treatments pursued; yet nothing palpable, or such as might lead to a suspicion of any serious derangement of the parts, was appreciable. Slight fever supervened, attended by anxiety of countenance, indicative of internal distress; the irritation in the rectum was now considerable, with desire to void both urine and excrements, which last were highly offensive and passed convulsively, while the former required a good deal of straining.

The symptoms, notwithstanding the treatment resorted to, continued unabated, and on the 2d of April an oblong swelling of a boggy character, attended with slight inflammatory blush, but void of pain on pressure, was observed on the left hip, about its junction with the perineal space. On the 3d it had increased considerably, extending in an antero-posterior direction, and caused obstruction to the passage of the urine. A deep incision was now made in the course indicated; the blood flowed profusely, and the tension and uneasiness were relieved and the passage of the urine facilitated. This was followed by warm anodyne fomentations during the day, but the inflammatory action continued to extend itself during the afternoon. By the evening it had extended towards the base, although no continuity of action could be observed. A fœtid odour was exhaled, and serous fluid, mingled with oily particles, flowed from the wound, which presented a very unhealthy appearance, its edges being everted. A large cataplasm of linseed was immediately applied to the whole of the parts, and a powerful opiate administered. On the 4th the symptoms had assumed a typhoid character; the inflammatory action of a low insidious character, killing as it went, had extended over the whole of the left nates and perineum, which were boggy to the "feel," and void of pain on pressure. The lips of the wound everted showed a gangrenous state of the cellular and adipose tissues; the præputium, distended with serum, was covered with a slight blush, and the scrotum had taken on the same action. Three grain doses of quinine were administered every two hours, with wine in the intervals; hot dressing with cataplasms to the affected nates and perineum, with evaporating lotion to the scrotum and penis, both of which were punctured in several points. He continued in much the same state throughout the day, save the inflammatory action, which extended up the back and over the scrotum. The hot dressing was now omitted, cataplasms continued and the opiate repeated.

*5th.* He passed a rather comfortable night, although no discernible improvement. The bowels are free, but the evacuations are passed with considerable convulsive action. The inflammatory action is extending: the lips of the wound are pressed outwards, and fœtid serum mingled with air exudes on the slightest pressure. The wound formerly made was now extended in length and depth, dividing in all parts entirely the fascia: the sphacelated parts were torn down with the fingers, and traced in every direction. At last an abscess, deeply situated, was penetrated, from which upwards of half a pint of thin unhealthy purulent matter was discharged. The interior of the abscess gave to the finger the conviction of the whole of its walls being in the same gangrenous state; but its extent could not be ascertained, nor could any communication between it and the rectum be discovered. The præputium, penis, and scrotum were distended to a painful extent. In both numerous punctures and incisions were made, permitting a quantity of serum to escape. The same treatment to be continued, but the cataplasms to be made of porter instead of water. *Vesp.*—He experienced great relief after the discharge of the purulent matter; but singultus has been very troublesome, coming on after swallowing the smallest quantity of fluid or solid, or on talking. To have the opiate.

*6th.* The singultus was relieved shortly after the administration of the opiate and has not since recurred; has passed a rather comfortable night; sphacelated spots and portions surround the punctures and incisions made in the scrotum and penis, both of which are again distended with thin serous fluid, exuding on pressure. The right nates, in which slight uneasiness was felt, has taken on the same action, is devoid of pain, even on considerable pressure. An extensive incision was made, when the same state as that of the other presented itself, and nought but serous fluid escaped from the wound. The bowels have been twice easily and fully evacuated; the dejections of a more healthy character. The same treatment, and a line of caustic to encircle the circumference of the inflamed portion of the back. During the 7th and 8th he continued in much the same state; the inflammatory action had ceased to extend up the back, but the nates still suffer from its ravages. The singultus proves very troublesome, and momentary relief can only be obtained by the camphor mixture with laudanum.

This morning, 9th, the symptoms are of a more unfavourable character. There are great drowsiness, with inability to fix the attention save for a few seconds; weak and almost flowing pulse; cold extremities; heavy and laboured respiration. A line of separation has formed on both scrotum and penis, the greater part of the cutaneous envelopes of which are in a sphacelated state. 10th. Passed a good night, sleeping more profoundly and composedly than he previously had done. Towards morning there was a generally diffused warmth, which was succeeded by a gentle warm diaphoresis, and the whole symptoms are a little improved. Pus discharges from the various wounds, and the separation on penis and præputium penis advance rapidly. The whole of each nates is now undermined and forms two bags. The parts to be bathed with decoction of bark, and the hips to be injected with it several times daily. This more favourable state, with gradual daily improvement, lasted till the 13th. The sloughs separating, acute sensibility is now felt over the whole of the diseased surface; but this morning early, having used considerable exertion in passing his urine, caused by the irritation at its neck, a portion of slough at the anterior part of the perineum became detached, bleeding supervened, and a very considerable portion was lost before it was observed. At 7. A. M. I found him in a very exhausted state, the blood still then oozing from ruptured or torn vessels, and part had become insinuated beneath the præputium and scrotum, causing great distension. The usual means for stopping hemorrhage under such circumstances were had recourse to with success, and by the careful and regulated administration of various stimuli, he again rallied, and towards evening his pulse had become fuller, and a general warmth was diffused. The 14th and 15th were passed with slight amendment, and on the latter day the sloughs became detached from the lower surface of the penis. The scrotum leaving the margins solely and the testes covered by nought but the *tunica vaginalis*, the whole centre of the perineum and from the left nates having a rather healthy granulating surface, bedewed with pus of a good quality; the sloughs of right nates protrude, and both it and the left present a bagged appearance. The same treatment to be pursued, with omission of the decoction of bark, which now excites pain. 17th. The change for the better in his state continues; the tongue has cleaned a little and is moist; the nights are passed more comfortably under the use of opiates gradually increased; the sores are clean, but the granulations are weak; the slough has come away from the right nates, and pus is secreted. There is now a sphacelating patch over the right *trochanter major*. 18th. Aphthae have attacked the tongue, tonsils, soft palate and uvula, producing great uneasiness and difficult deglutition, but the stomach still retains its power of receiving and also of digesting. Sol. of sulph. of zinc to granulating surface, linctus of honey and zinc for the aphthae, and the same constitutional treatment. 22d. The anxiety for the last three days has been very great; the aphthous affection has extended down œsophagus. Last evening had an attack of vomiting, which lasted through the greater part of the night. The sores look pale and glazed; pus of a very thin consistence pours out on pressure being made on the nates. The cutaneous parts over both trochanters have sloughed, adding to sufferings already great. The anxiety and indescribable sensations gradually increased upon him, causing a continual desire for every thing which could be procured, but all proved equally ineffectual in allaying them in the slightest degree. At length, nature exhausted, he, with scarcely more than a struggle, shortly after noon of the 23d, died.

A few days only had elapsed before I was called in with Deputy-Inspector Robertson, who had attended along with me the case we have now detailed, to consult on the Austrian Consul-General, a gentleman upwards of 80 years of age, in whom we found the same disease present, and in whose case also there had been those disagreeable indescribable sensations about the rectum for months previously. When we saw him he was insensible; but a reference to the part, to which they had been applying leeches, soon told too clearly how very hopeless any application could be. An extensive incision was immediately made, demonstrating to all around the state of the subjacent parts. The rectum was almost isolated, and the finger could be passed in various directions to a great depth, in nought but a gangrenous mass. The patient sank the same evening without a struggle.

## ART. V.—*On the Buffy Coat of the Blood.* By GEORGE GULLIVER, F. R. S., Surgeon in the Royal Regiment of Horse Guards. (Read at the Royal Medical and Chirurgical Society, February 11, 1845.)

I. *Historical notices of the consistency of the Blood, and of the condition of the red corpuscles in inflammation.*—Boerhaave[*] and his commentator Van Swieten maintained that a lentor or viscidity of the blood is connected with inflammatory disease. Langrish[†] describes the blood in acute fevers as being more than usually viscid and tenacious, and as containing an excess of red corpuscles. He held the incorrect opinion, common to many eminent men, either his contemporaries or immediate predecessors, as Boerhaave,[‡] Keill,[§] Jurin,[‖] and Haller,[¶] that coagulation is caused merely by a running together of the red corpuscles.

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[*] Aphor. 100, 110, 117, 375, 663.

[†] Practice of Physic, pp. 22 and 74, 8vo. Lond. 1735.

[‡] Prælectiones Academicæ, ed. Alb. Haller, § ccxxvii. t. ii. 8vo. Gottingæ, 1740.

[§] Essays on several parts of the Animal Economy, p. 95, *et seq.* 2d ed. 8vo. Lond. 1717.

[‖] Phil. Trans. 1719, vol. 30, p. 1000.

[¶] Deux Memoires sur le Mouvement du Sang, p. 21–22, 8vo. Lausanne, 1756.

Triller,[*] Schwenke,[†] Dr Francis Home,[‡] Huxham,[§] and Marherr,[‖] concluded that the viscidity of the blood is increased during inflammation; and this state of the blood was made the subject of several dissertations about the middle of the last century, as by Klein,[¶] Goesling,[**] Pohlius,[††] and Nicolai.[‡‡]

On the contrary, Buechner[§§] wrote a treatise on a thinned state of the blood. Quesnay[‖‖] believed that the floating of the humour which forms the buffy coat, and which he states is of the same nature as the lymph, so far from indicating a thickening, really shows that the fluidity of the blood is increased.

Quesnay also states, in anticipation of a very recent doctrine, that the buffy part is formed from the red corpuscles, destroyed and reduced into a glaire by the action of the arteries, and that this glaire abounds in acute diseases at the expense of the corpuscles, sometimes to such an extent that the red part is much diminished. Bordenave[¶¶] held somewhat similar views.

Dr Richard Davies,[***] observing the quickened sinking of the red corpuscles in blood becoming buffy, inferred that there was a preternatural attenuation of the coagulable lymph. He called this spontaneously coagulable matter, after Borelli,[†††] the gluten. We owe to Dr Davies the earliest correct description, printed in our language, of this principle of the blood; which I mention with the hope of drawing him from the oblivion to which he has been so long and so unjustly consigned, and to notice the strange silence of the Hunters and their encomiasts about his researches.

It is now well known that the buffy coat is formed of fibrin left at the surface of the clot by the sinking of the red corpuscles. Like Davies, Mr Hewson[‡‡‡] and Dr Davy[§§§] attributed this sinking chiefly to an increased tenuity of the coagulable lymph, an inference which the two last distinguished physiologists drew from the fact discovered by Hewson, that the corpuscles fall more rapidly in the entire mass of the blood, during the formation of the buffy coat, than they will do in the serum alone. Similar views were adopted by Thomas Houlston,[*] Dr George Fordyce,[†] Dr William Hunter,[‡] Dr James Makittrick,[§] Dr George Levison,[||] Dr James Gregory,[¶] Dr Cullen,[**] Hugh Moises,[††] James Wilson,[‡‡] and others. But Mr Hey[§§] maintained that the blood is not thinned during inflammation; Mr Grainger[||||] is of the same opinion, and Professor Henle and Mr Wharton Jones[¶¶] state that the coagulable lymph is really thickened.

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[*] Com. de Pleuritide, §§ xxviii. and xlvii. 8vo. Francof. et Moenum, 1740.

[†] Hæmatologia, p. 154, *et seq.* 8vo. Hagæ Com. 1743.

[‡] Principia Medicinæ, p. 101. 8vo. Edin. 1758.

[§] Essay on Fevers, chap. 4, p. 36. 8vo. Lond. 1769.

[‖] Prælectiones in H. Boerhaave, Inst. Med. t. 2, p. 254. Vien. et Lips. 1772.

[¶] De Massæ Sang. Viscedine. 4to. Argentorati, 1737.

[**] Diss. Inaug. de Spissitudine Sanguinis. 4to. Gottingæ, 1747.

[††] De Spissitudine Sanguinis a neglecto motu. 4to. Lips. 1749.

[‡‡] De Spissitudine Sanguinis. 4to. Halæ, 1749.

[§§] De nimia Sang. Fluidit. 4to. Halæ, 1749.

[‖‖] Traité de la Saignée, pp. 405, 406, 415, 416. 8vo. Paris, 1760.

[¶¶] Essai sur la Physiologie, p. 155–156. 8vo. 4e ed. Paris, 1787.

[***] Essays on the Human Blood, p. 23. 8vo. Bath, 1760.

[†††] De Motu Animalium, Op. posth. pars. alt. Prop. cxxxii. 4to. Romæ, 1681.

[‡‡‡] Exp. Inq. Part 1, p. 45, *et seq.* 8vo. Lond. 3d ed. 1780.

[§§§] Researches, Phy. and Anat. vol. ii. p. 48. 8vo. Lond. 1839.

The last two authors and Professor Wagner ascribe the formation of the buffy coat to an increased disposition of the red corpuscles to run together, as originally explained by Professor Hermann Nasse[***] of Marbourg, and thus described by Mr Jones: "The minute process leading to the separation of the *liquor sanguinis* from the red corpuscles, the visible condition for the formation of the buffy coat, consists in an exaltation both of the rapidity and closeness with which the red corpuscles aggregate into rolls, and these again into a sponge-work, thus squeezing out the *liquor sanguinis* from among the corpuscles, and allowing the greater specific gravity of the latter to come more fully into play, whereby the *liquor sanguinis*, which in such cases is in relatively greater quantity, collects at the top, and, coagulating, gives rise to the buffy coat."

Dr Davy[†††] observed, that, in certain cases in which the inflammatory state is best marked, the separation of the corpuscles and coagulable lymph is most rapid. Dr Stoker[‡‡‡] has also shown that the buffy coat may occur in blood which coagulates more quickly than usual. In a thin film of such blood, Schroeder Van der Kolk, and Dr Alison,[§§§] observed that the corpuscles separate laterally, giving it a mottled appearance, as characteristic of the state of the blood as the buffy coat itself; a fact which seems to have been described by Mr Hunter as follows in his Surgical Lectures, when speaking of the blood in inflammation: "The blood has an increased disposition to separate into its component parts, the red globules become less uniformly diffused, and their attraction to one another becomes stronger, so that the blood when out of the vessels soon becomes cloudy or muddy and dusky in its colour, and, when spread over any surface, it appears mottled, the red blood attracting itself and forming spots of red. This is so evident in many cases that it is hardly necessary to wait till the whole coagulates to form a judgment of it."[*] Dr Charles J. B. Williams[†] thinks that the aggregation of the corpuscles may be a mechanical one, induced by a change in the relative dilution of the *liquor sanguinis*, or serum, within and without the blood corpuscle.

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[*] Diss. Med. Inaug. de Inflammatione, p. 14. 4to. Lugd. Bat. 1767.

[†] Elements of the Practice of Physic, Part 2, p. 28–30. 8vo. Lond. 1768.

[‡] Lectures, p. 8–9, 4to, MS. press mark D. D. f. 6, in Lib. Roy. Med. Ch. Soc. No date, but some of Hewson's experiments are noticed.

[§] Com. on the Princ. and Practice of Physic, p. 154. 8vo. Lond. 1772.

[||] An Essay on the Blood, p. 86. 8vo. Lond. 1776.

[¶] Conspectus Med. Theor. t. I. §§ 503 and 504. 8vo. ed. alt. Edin. 1782.

[**] First Lines of the Practice of Physic, vol. i. § ccxli. 8vo. Edin. 1789.

[††] Treatise on the Blood, p. 48. 8vo. Lond. 1794

[‡‡] Lectures on the Blood, p. 53. 8vo. Lond. 1819.

[§§] Observations on the Blood, p. 14. 8vo. Lond. 1779.

[||||] Elements of Gen. Anat. p. 41. 8vo. Lond. 1829.

[¶¶] Report, §§ 1, 2, 40, 45, 49, in No. 34 of Brit. and For. Med. Rev., and §§ 9, 107 in No. 35 of same Review.

[***] Henle, Anat. Gener. tr. par Jourdan, p. 468. 8vo. Paris, 1843; and Mr Jones's Obs. on the Blood, pp. 12–17, reprinted from No. 28 of Brit. and For. Med. Rev.

[†††] Phil. Trans. 1822, p. 271.

[‡‡‡] Pathological Observations, pp. 37 and 44. 8vo. Dublin, 1823.

[§§§] Outlines of Phys. and Path. p. 47. 8vo. Edin. 1833.

Since the publication of the accurate description by Dr Hodgkin and Mr Lister,[‡] the running together of the red corpuscles of the healthy blood of mammalia into piles has become well known.[§] The effect of mucilage or white of egg in promoting their further aggregation was observed by Mr Wharton Jones[||] and Professor Henle; and I have been informed by Mr Jones that there are some observations on the subject by Nasse.[¶] The effect of neutral salts in separating the corpuscles from each other was noticed by Eller,[**] and since by Dr Davy[††] and others.

II. *Separation of the red corpuscles and liquor sanguinis in the blood of the horse.*—When the venous blood of this animal is received into a small narrow vase, an upper buffy part regularly forms, quite equal in perpendicular measurement to the lower red part of the clot. This spontaneous separation was probably known to Harvey[‡‡]; it is mentioned by Dr Allen Thomson,[§§] and more particularly by Andral,[||||] Gavarret, and Delafond. My observations, unless otherwise expressed, were made on the blood of the horse.

III. *Sinking of the corpuscles in the liquor sanguinis and in the serum.*—It is certain that the corpuscles sink at least twice faster in the entire mass of the blood, during the formation of the buffy coat, than they will do in the serum alone, as is shown in the details of experiments 4–10.

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[*] Hunter's Works by Palmar, Vol. i. p. 235. 8vo. Lond. 1835.

[†] Principles of Medicine, p. 89. 8vo. Lond. 1843.

[‡] Philosophical Magazine, Vol. ii. p. 135, July—December, 1827.

[§] Dr Davy has lately described the viscid or adhesive quality of the corpuscles. See Trans. Roy. Soc. Edin. 1845. vol. xvi. p. 54–55.

[||] Report, §§. 2 and 3, Brit. and For. Med. Rev. No. 34.

[¶] Das Blut, pp. 223, 225, and 231. 8vo. Bonn, 1836.

[**] Hist. de l'Acad. des Sciences, année 1751, pp. 13, 14.

[††] Res. Phy. and Anat. Vol. ii. p. 178. 8vo. Lond. 1839.

[‡‡] De Generatione Animalium, p. 160. 4to. Lond. 1651.

[§§] Syllabus of Lectures on Physiology, p. 13. 8vo. Edin. 1835,

[||||] Hematologie Pathologique, pp. 28 and 50. 8vo. Paris, 1843.

IV. *Spontaneous acceleration of the rate of sinking of the corpuscles in the liquor sanguinis and in the serum.*—During the formation of the buffy coat, it is very remarkable that the corpuscles fall much faster after the first two or three minutes than before. In a mixture of serum and corpuscles, either fresh or after it has been kept some hours and occasionally agitated, there is also an acceleration, though to a less degree, in the rate with which the corpuscles subside. It is commonly greatest in the *liquor sanguinis* between the third and sixth minutes, and sometimes later; and later still in the serum.

V. *The falling of the corpuscles rather retarded than hastened by a thinning of the liquor sanguinis.*—If the rapid falling of the corpuscles, during the formation of the buffy coat, be due to an attenuation of the *liquor sanguinis*, it follows, that, if we increase this quality without hastening coagulation or making the corpuscles lighter in relation to the containing fluid, they will sink still more quickly, and be suspended again when the mixed fluid is made thicker. I accordingly mixed dilute saline solutions and urine with the blood, by all of which its consistency and specific gravity were reduced, and its coagulation somewhat retarded. Yet in none of these mixtures was the falling of the corpuscles so rapid, nor the buffy coat so thick, as in some pure blood set apart for comparison; while in one mixture of urine and blood, which remained liquid for upwards of fifteen minutes, the corpuscles never sank enough to leave the slightest buffy surface.

It was remarkable, too, that when there was a falling of the corpuscles in these mixtures, the acceleration above noticed in the rate of sinking after a few minutes was prevented.

When the same quantity of salt was dissolved in mucilage and mixed with the blood, the corpuscles, so far from being suspended, always fell more rapidly than in blood thinned by the saline matter in water, sometimes as quickly as in pure blood, occasionally quicker; and now and then with such velocity, that a clear floating portion of *liquor sanguinis*, two inches deep, appeared in five minutes.

In this case, the acceleration in the rate with which the corpuscles sunk, after the first two or three minutes, was still greater than in pure blood.

Some trials were next made on the falling of the corpuscles in serum made thinner and lighter by the weak saline solutions, and in serum made thicker and heavier by mucilage; whence it resulted, calculating from the time required for the appearance of a clear stratum of fluid at the top of the mixtures, that the corpuscles subsided more rapidly in the thicker than in the thinner fluid.

That the *liquor sanguinis* becomes viscid in changing from the liquid to the solid state, as originally described by Dr Davy,* is a fact easily shown. But, on the other hand, it has never been supposed that it becomes thinner before it coagulates, after its abstraction from the animal. Yet to this improbable conclusion we shall be led, if we admit that the sinking of the corpuscles in the *liquor sanguinis* is a correct measure of its consistency or tenuity.

VI. *State of the red corpuscles in buffy blood.*—As it is certain, *cæteris paribus*, that the falling of particles through a light and thin fluid must be quicker than through a heavier and thicker one, the state of the corpuscles in these different fluids cannot be equal.

And that such is really the case, may easily be seen with the naked eye. Thus, in thin layers of those viscid mixtures in which the corpuscles sunk most rapidly, they were so clustered as to appear like particles of coarse and dark red powder in an excess of limpid fluid; while the thinner mixtures, in which the corpuscles fell most slowly, were of an uniform and lighter red colour, from the separation and equable diffusion of the corpuscles throughout the fluid. With the aid of the microscope the corpuscles of human blood, which had no buffy coat, were seen frequently in piles; but these were only occasionally grouped into clusters, and by far the greater number of the corpuscles were either separate or very loosely connected together. In buffy human blood the corpuscles are more aggregated. But it is in the naturally buffy clot of the horse's blood that the aggregation of the corpuscles is most remarkable; they appear as if melted together, and are almost universally collected into clusters, the piles sticking to each other. These observations were made at various times after coagulation.

VII. *Agents which prevent and increase the aggregation of the corpuscles.*—When a saline solution was mixed with the clustered corpuscles, their connection was quickly dissolved, so that they were all separated and equably diffused throughout the liquid. Either urine or syrup had the same effect. On adding mucilage, the corpuscles again became aggregated, and they were again dispersed by another dose of saline matter. A small proportion of salt mixed with the mucilage promotes the clustering of the corpuscles more than the mucilage alone, as is shown in experiments 22–25. The salt alone had the effect of more or less reducing the size of the corpuscles, as if it dissolved a part of their surface. The serum of one animal often causes the corpuscles of another animal to become aggregated very quickly.

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* Phil. Trans., 1822, p. 273.

VIII. *A probable cause of the efficacy of saline medicines in inflammation.*—As only a very weak saline solution is required to prevent or destroy the aggregation of the corpuscles, and to correct the tendency in the blood to the formation of the buffy coat, may not this action of the salt be one cause of the well-known utility of saline medicines in inflammatory diseases?

IX. *Cause of the rapid sinking of the corpuscles, and of its accelerated rate during the formation of the buffy coat.*—The aggregation of the corpuscles was connected with their most rapid sinking, and their separation and diffusion with their most tardy sinking; while their rate of falling was hastened by a thickening and retarded by a thinning of the *liquor sanguinis.* The largest particles of a powdered substance will sink quicker in a fluid than the smallest particles. In some experiments with magnesia in a solution of Epsom salt, and with poppy seed in mucilage, there was no evident acceleration in the rate of sinking, similar to that of the red corpuscles through the *liquor sanguinis.* I know not that this acceleration can be explained otherwise than by the increasing aggregation of the corpuscles during their descent. Yet there was a like acceleration, though to a less degree, in the falling of the corpuscles through the serum, in which they were clustered from the beginning of the experiment, or even many hours before. But the masses may coalesce still further during their descent; and it will be recollected that the accelerated sinking is quite prevented, or even reversed, when the corpuscles are kept apart by weak saline solutions.

X. *Details of Experiments.*—For the sake of precision, which appears the more necessary since Mr Prater* has shown the opposite effects on the blood of different quantities of the same substance, I shall detail some of the principal experiments made in the course of the present inquiry. They will be found to illustrate many points foreign to the subject now considered, such as the effects of various substances on coagulation and on the contraction of the clot. The experiments were all conducted under the following circumstances, unless otherwise mentioned; and my best thanks are due to Mr Siddall, the able veterinarian of the Blues, for his kind assistance. The blood used was drawn from the jugular veins of troop horses; and, in comparative trials, in order that every portion of it should be as nearly as possible alike, the blood was received from the animal into a pitcher, stirred for a few seconds with a stick, and then quickly poured into the different vases for observation. These were common circular glass bottles, with the tops cut off, and holding about six ounces when filled within about half an inch of the rim; thus filled, the column of fluid measured about four inches in length, and one and three-fourths in diameter. The agitation used to mix the different matters with the blood was also applied to the pure blood set apart for comparison. As the corpuscles in pure blood are soaked in the *liquor sanguinis*, they were well mingled with the artificial fluids. If dropped on or only just dipped in a dense saline solution they may remain awhile at the top, just as a piece of fibrin will do, though it sinks at last, in a saturated solution either of Glauber's salt, of nitre, or of muriate of soda. This is an important fact in relation to the use of such solutions in estimating the specific gravity of fibrin, as was done by that excellent observer, Dr Benjamin Babington.* His estimate was probably too high, as the saline solution deprives the fibrin of some of its natural moisture. In a weak saline solution, the corpuscles will fall rapidly before they become disjoined and saturated, though very slowly afterwards. If they become specifically heavier or lighter by endosmosis or exosmosis, it may be supposed that their specific gravity would only be approximated, within certain limits, to that of the fluid in which they are placed; and that they would differ no more from the fluid in that respect than they did originally from the *liquor sanguinis*. When the corpuscles are stated to have sunk to any extent, it is merely meant to express that a clear supernatant stratum of fluid was left, corresponding to the given measure; and when it is noted that there was no sinking of the corpuscles, it is simply to affirm that enough of them remained at the top to preserve its opaque red colour.

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* Experimental Inquiries in Chemical Physiology, Part 1, p. 37, 8vo. Lond. 1832. He observed that adding serum to blood hastens its coagulation. Op. cit. p. 105.

XI. *Sinking of the corpuscles in blood received from the animal, and not agitated afterwards.*

I. In 3⅓ minutes the corpuscles sunk ⅓ inch.
5⅓ . 1
7¾ . . 1½
8¾ . 2 inches.
9¾ . . 2⅓

XII. *Sinking of the corpuscles in the same blood, broken up in the serum twenty-four hours afterwards, and strained through linen.*

II. In 6 minutes the corpuscles sunk ⅛ inch.
8 . ¼
11 . . ½
16 . 1
26 . . 1¾
34 . 2 inches.

3. In some blood from another horse, treated in the same way

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* Cyclop. of Anatomy, vol. i. p. 418.

after keeping seven hours, the corpuscles fell, in eleven minutes one inch, and in twenty-three minutes two inches.

### XIII. *Comparative sinking of the corpuscles in the liquor sanguinis and in serum.*

4. Blood divided into three portions. In the *liquor sanguinis* the corpuscles sunk,

| | |
|---|---|
| In 2¼ minutes, | ⅛ inch. |
| 3¼ | ¼ |
| 4¼ | ⅜ |
| 5 | ½ |
| 6 | ¾ |
| 7 | 1 |

5. In a second portion, deprived of fibrin by whipping, the corpuscles sunk.

| | |
|---|---|
| In 5 minutes, | ⅛ inch. |
| 7 | ¼ |
| 9 | ⅜ |
| 10 | ½ |
| 13 | ¾ |
| 15 | 1 |

6. In the third portion, deprived of fibrin by agitation with nails in a bottle, excluding air as much as possible, the corpuscles fell at the same rate. The specific gravity of the serum at 60° was 1029; and it coagulated at a heat of 158°.

7. In the *liquor sanguinis* of another horse the corpuscles subsided,

| | |
|---|---|
| In 2¼ minutes, | ⅛ inch. |
| 3¼ | ¼ |
| 4¼ | ⅜ |
| 4¾ | ½ |
| 5 | ⅝ |
| 6 | ¾ |
| 8 | 1¼ |
| 9 | 1½ |
| 10¼ | 2 inches. |

At the end of fourteen minutes there was a film on the top; beneath quite liquid; coagulated in sixteen minutes. Final perpendicular measurement of the upper buffy part two and a-half, and of the lower red part, one and three-fourth inches.

8. In a second portion, immediately after removing the fibrin in a bottle, excluding air, the corpuscles subsided,

| | |
|---|---|
| In 8 minutes, | ⅛ inch. |
| 11 | ¼ |
| 12¼ | ⅜ |
| 13 | ½ |
| 14 | ⅝ |
| 15¼ | ¾ |
| 17¼ | 1 |
| 20 | 1¼ |
| 21 | 1½ |
| 24 | 1¾ |
| 27 | 2 inches. |

9. After the lapse of twenty-four hours the superstratum of serum, in Exp. 8, measured two and seven-eighth inches, and the substratum of corpuscles one and three-fourth. The mixture was then shaken, when the corpuscles sunk as follows:

| | |
|---|---|
| In 11 minutes, | ⅛ inch. |
| 14 | ¼ |
| 15⅛ | ⅜ |
| 16¼ | ½ |
| 17¾ | ⅝ |
| 19 | ¾ |
| 20 | ⅞ |
| 21 | 1 |
| 22¼ | 1⅛ |
| 23¾ | 1¼ |
| 25 | 1⅜ |
| 27 | 1½ |
| 31 | 1¾ |
| 36 | 2 inches. |

10. In the same mixture, after agitation the next day, the corpuscles fell at the same rate. They subsided most slowly in the newest serum in Exp. 35 and 36.

### XIV. *Sinking of the corpuscles of one animal in the serum of another.*

11. Corpuscles of human blood which took 13 minutes to sink ⅛th of an inch in their own serum, sp. gr. 1028, sunk in horse's serum, of the same sp. gr., above twice as rapidly, and with a remarkable acceleration after they began to sink. The aggregation of the corpuscles was very plain to the naked eye quickly after they were put into the horse's serum. See Exp. 37 and 41.

12. Corpuscles from horse's blood sunk quicker in human serum, sp. gr. 1032, than in their own serum, sp. gr. 1028.

### XV. *Slow sinking of the corpuscles in weak saline solutions.*

13. ℥ss. of mixed serum and corpuscles agitated with ℥iv. of solution of nitre, 10 grains to an ounce of water, sp. gr. 1020. The corpuscles took an hour to sink an inch.

14. A similar trial, substituting urine, sp. gr. 1024, for the solution of nitre. The corpuscles fell equally slow.

15. In the serum, sp. gr. 1028, for comparison with Exp. 13–15, the corpuscles sank half an inch in 15 minutes.

### XVI. *Formation of the buffy coat prevented or lessened by making the blood thinner and lighter, and its coagulation retarded.—Sinking of the corpuscles slower after a few minutes, contrary to their rate of falling in pure blood.*—N. B. Sp. gr. of the weakest saline solution 1011, five grains of common salt to an ounce of water; the weak saline solution, sp. gr. 1020, 10 grains to the ounce. Urine, sp. gr. 1023.

16. Equal parts of urine and blood. Liquid at the end of fifteen minutes; began to coagulate around the margin in seventeen minutes; a soft jelly in twenty-two minutes. There was no buffy coat. See Exp. 19.

17. Pure blood, for comparison with Exp. 16. The corpuscles fell an inch in seven minutes, and it coagulated in twelve minutes.

18. Blood for this and the next three experiments from another horse. A portion of the unmixed blood coagulated in ten minutes, and the corpuscles sunk very nearly as noticed in Exp. 4.

19. Equal parts of urine and blood. In four minutes the corpuscles sunk one-fourth of an inch; and ultimately no more than three-eighths of an inch. Coagulation did not begin until after sixteen minutes. Differs from the like Exp. 16, in which there was no sinking of the corpuscles.

20. Equal parts of weakest saline solution and blood. In four minutes the corpuscles sunk one-eighth of an inch; in eight and a-half minutes one-fourth of an inch; and never more than three-fourths of an inch. Mixture liquid at the end of twenty-two minutes; viscid in twenty-five; jellied in twenty-eight.

21. Equal parts of weak saline solution and blood. In four minutes the corpuscles sunk one-eighth of an inch; and finally, no more than three-eighths. Coagulation two minutes sooner than with the weakest saline solution, Exp. 20.

## XVII. *Sinking of the corpuscles accelerated by adding mucilage and salt to the blood.*

22. ℥iss of mucilage, sp. gr. 1030, seven and a-half grains of muriate of soda, ℥iii. of blood. Sinking of the corpuscles very rapid, and the rate much accelerated after a minute or two, viz.

| | |
|---|---|
| In 3 minutes, | ⅜ inch. |
| 3½ | 1 |
| 5 | 2 inches. |
| 7 | 2½ |
| 9 | 2¾ |

Coagulated in eighteen minutes; buffy part throughout firm and contracted next day.

23. ℥iss. of the same mucilage, ten grains of muriate of soda, and ℥iii. of blood. The corpuscles sunk,

| | |
|---|---|
| In 3 minutes, | ⅜ inch. |
| 4 | 1 |
| 5 | 1¼ |
| 9 | 1¾ |

Coagulated in thirteen and a-half minutes. Buffy part firm and contracted next day. Aggregation of the corpuscles, as in Exp. 22, quite plain to the naked eye.

24. ℥i. mucilage, sp. gr. 1085, and ℥iv. of blood. The corpuscles sunk,

| | |
|---|---|
| In 4 minutes, | 1/8 inch. |
| 7 | 1/4 |
| 9 | 1/2 |
| 10 | 7/8 |
| 13 | 1¼ |

Not coagulated in less than twenty minutes. Contraction of clot very slight next day. The corpuscles sunk rather slower than in pure *liquor sanguinis*, but much faster than in blood, mixed with dilute saline solution without mucilage.

25. ʒi. of the same mucilage, ten grains of muriate of soda, and ℥iv. of blood. The corpuscles sunk,

| | |
|---|---|
| In 6 minutes, | 3/4 inch. |
| 8 | 7/8 |
| 9 | 1 |
| 10 | 1⅛ |
| 13 | 1¼ |

Coagulated two or three minutes quicker, and the clot contracted rather more than in Exp. 24.

26. ℥iss. weakest saline solution, and ʒiii. of blood. In three minutes the corpuscles sunk one-eighth of an inch; in five minutes one-fourth; in ten minutes one-half. A film on the top in twelve minutes; coagulated in fourteen.

27. ℥iss. weak saline solution, and ℥iii. of blood. In three and a half minutes the corpuscles sunk one-eighth of an inch; in six minutes one-fourth; and finally, only three-eighths of an inch. Viscid in ten minutes: a trembling clot in twelve.

28. A portion of blood used in the experiments from 22 inclusive, coagulated in ten minutes, and had an upper buffy part equal in perpendicular measurement to the lower red part.

In all the trials of urine and the saline solutions with blood, the contraction of the clot was either much diminished, or prevented; though not so when mucilage was added with the salt. Coagulation was most retarded by the weakest saline solution.

XVIII. *Sinking of the Corpuscles more rapid in serum made thicker and heavier, than in serum made thinner and lighter. The accelerated rate of sinking promoted by the thicker and prevented or diminished by the thinner fluid.*—N. B. Saline solution, sp. gr. 1020, 10 grains of muriatic of soda to an ounce of water. Urine sp. gr. 1026. Mucilage, sp. gr. 1085, ʒiv. of gum arabic to a pint of water. Blood in Exp. 29–35 drawn twenty-four hours; fibrin separated from it in a bottle excluding air; sp. gr. of serum 1028.

29. Equal parts of saline solution and blood without fibrin. In forty minutes the corpuscles fell one-twelfth of an inch, in 150 minutes three-eighths of an inch.

30. The same, adding ʒi. of mucilage. Sinking of the corpuscles rapid, but the separation of them from the fluid at first imperfect. It was clearer in one minute half an inch from the

top. In six minutes the corpuscles had fallen through the column of the fluid, the line of separation between it and the corpuscles being distinct one inch from the bottom. After shaking the mixture next day, they subsided in two minutes one-fourth of an inch, and then with the same velocity as the day before.

31. Equal parts of urine and blood without fibrin. In forty minutes the corpuscles fell one-twelfth of an inch; in 150 one-fourth of an inch.

32. The same, adding an ounce of mucilage. In fourteen minutes the corpuscles sunk one-fourth of an inch; in seventeen minutes half an inch; in twenty-three minutes one inch; in thirty-one minutes one and a half inch; in forty-eight minutes one and seven-eighths of an inch.

33. ʒi. of saline solution and ʒiii. of blood without fibrin. In eleven minutes the corpuscles sunk one-eighth of an inch; in fifteen minutes one-fourth of an inch.

34. ʒi. of mucilage and ʒiii. of blood without fibrin. Sinking of the corpuscles quick, but the line between them and the supernatant fluid at first indistinct. In six minutes they subsided about one-eighth of an inch; in eleven minutes three-fourths of an inch; in fifteen minutes one and a half inch, with a distinct line between the corpuscles and the fluid.

35. Blood without fibrin for comparison with Exp. 29–35. The corpuscles sunk in six minutes one fourth of an inch; in eleven and half minutes half an inch; in fifteen minutes one and a half inch.

36. The same, only an hour after it was drawn. The corpuscles fell in twelve minutes a quarter of an inch; in fifteen minutes half an inch; in thirty minutes one and a half inch. Thus the sinking was the slowest in the newest serum, contrary to Exp. 8, 9, and 10.

37. Blood without a buffy coat, taken twenty-four hours before from the basilic vein of a man, aged forty, affected with pulmonary catarrh. Clot broken up in the serum and strained through tow. The mixture thicker and darker than horse's blood, apparently from a greater proportion of corpuscles. They took sixty minutes to sink one-eighth of an inch. See Exp. 11 and 41. The three next experiments with parts of the same blood.

38. ʒi. of mucilage mixed with ʒiii. of the strained blood. The corpuscles sank in thirty-two minutes one-eighth of an inch; in forty minutes one-fourth.

39. ʒi. of saline solution and ʒiii. of the strained blood. In forty minutes the corpuscles subsided one-tenth of an inch.

40. Sp. gr. of the serum 1027. It coagulated at a heat of 159.

41. Blood with a thick buffy coat from a young man with pulmonary catarrh. Strained as in Exp. 37. Thicker and darker,

apparently from a greater proportion of corpuscles than horse's blood. They sunk in thirty-nine minutes one-tenth of an inch; in fifty-six minutes one-eighth of an inch. See Exp. 11 and 37.

### XIX. *Effects of syrup made of equal parts of white sugar and water.*

42. ℥iss. syrup and ℥iii. of blood. No sinking of the corpuscles. A weak jelly in twelve and a half minutes. No contraction of clot or exudation of serum.

43. ℥iss. syrup, ten grains of muriate of soda, and ℥iii. of blood. Same as the foregoing, except that coagulation was two minutes later.

44. Blood for comparison with Exp. 42 and 43. Coagulated in eleven minutes, with the usual deep buffy coat.

### XX. *Effects of increasing the proportion of serum and of water in the blood.*

45. ʒss. serum added to ℥iv. of blood. The corpuscles sunk in two and a half minutes one-eighth of an inch; in three minutes one-fourth, and never subsided further. Coagulation took place in eight minutes.

46. ℥iss. of serum to ℥iv. of blood. The corpuscles fell in 3 minutes ¼ of an inch; in 5 minutes ½ an inch, and sunk no further. Coagulation in 7 minutes.

47. Some blood, for comparison with Experiment 45 and 46, coagulated in 10 minutes, and the corpuscles sunk as deep as usual.

48. ℥i. of serum and ℥iv. of blood from another horse. The corpuscles sunk only ⅜ths of an inch. Coagulation took place in 4 minutes.

49. ℥ii. of serum and ℥iv. of blood. Coagulation and sinking of the corpuscles the same as in the foregoing.

50. Blood, for comparison with Experiment 48 and 49, coagulated feebly in 6 minutes, when the corpuscles had fallen one inch.

51. ℥i. of serum and ℥iii. of blood from another horse. Corpuscles sunk ⅛th of an inch. Coagulated in 3½ minutes. Clot much contracted next day.

52. ℥i. distilled water and ℥iii. blood. No sinking of the corpuscles. Coagulated in 6 minutes. Clot contracted next day, but less so than the preceding.

53. Blood for comparison with Exp. 51 and 52. Coagulated in three and a-half minutes. No buffy coat.

54. ℥i. of serum and ℥iii. of blood from another horse. Corpuscles sunk in four minutes three-eighths of an inch; in five minutes two-thirds of an inch; in six minutes one inch; in seven minutes one inch and a quarter, and never further. Coagulated in eight minutes.

55. ʒi. distilled water and ʒiii. blood. Corpuscles sunk in seven minutes one-eighth of an inch, and finally no more than one-third of an inch. Began to coagulate in thirteen minutes, and a feeble jelly in fifteen.

56. Blood for comparison with Exp. 54 and 55. Corpuscles sunk in four minutes one-eighth of an inch; in five minutes one-fourth of an inch; in six minutes one-half of an inch; in seven minutes one inch; and finally one inch and three-fourths. Coagulation the same as in Exp. 55.

### XXI. *Effects of increasing the proportion of the corpuscles.*

57. ʒj. of corpuscles and serum, obtained by straining the broken up clot and serum through linen, mixed with ℥iv. of blood, part of that used in Exp. 48, 49, and 50. No sinking of the corpuscles. Coagulated rather firmly in three minutes.

58. The same, with an additional ounce of strained cruor, gave the same result, except that coagulation was half a minute later.

59. ʒvj. of whipped blood and ʒiv. blood from another animal. No sinking of the corpuscles. Coagulated firmly in seven minutes.

60. The same, with double the quantity of whipped blood, gave the same result.

61. ℥j. of whipped blood and ʒiv. of blood. The corpuscles subsided in three and a half minutes one-eighth of an inch; in four and a half minutes one-fourth of an inch; in six minutes three-eighths of an inch; and, finally, no farther. Coagulated in less than eight minutes. In this experiment the corpuscles sank more quickly, when added to blood just drawn, than they would do in the serum alone.

62. ʒvi. of corpuscles, from which as much serum as possible had been decanted, and ʒiv. of blood. No sinking of the corpuscles. Coagulated in six minutes.

63. A portion of the blood used in Exp. 59 to 63, set apart for comparison, coagulated in fourteen minutes, with a buffy part two inches deep.

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Some of the conclusions from the preceding experiments may here be recapitulated.

1. There is a remarkable acceleration, after a few minutes, of the rate with which the red corpuscles sink in the *liquor sanguinis;* and in the serum alone, though to a less degree.

2. This acceleration may be increased by increasing the aggregation of the corpuscles; and prevented or reversed by preventing or destroying the aggregation of the corpuscles.

3. The sinking of the corpuscles may be slower in blood thinned by weak saline solutions than when mucilage is added with the salt.

4. The sinking of the corpuscles is slower in serum made thinner and lighter by weak saline solutions, than in serum made thicker and heavier by mucilage.

5. In the blood of the horse, the buffy coat forms regularly; and the red corpuscles unite, as if partly fused into each other, and collect into masses.

6. There may be no buffy coat, or but a comparatively thin one, on this blood, when it has been made thinner and its coagulation retarded.

7. The formation of the buffy coat is neither due to an attenuation of the *liquor sanguinis*, nor to a diminution of its specific weight, nor to slow coagulation; but to an increased aggregation and quickened sinking of the corpuscles.

8. These facts are favourable to the old doctrine of lentor or viscidity of the blood and union of the corpuscles; and against the more recent doctrine of attenuation of the blood in inflammation.

9. The corpuscles of the horse sink much quicker in his serum than the corpuscles of man do in his.

10. Increasing the proportion of the corpuscles hastens coagulation and diminishes the formation of the buffy coat more than increasing the serum only.

11. Increasing the proportion of water simply, does not hasten the coagulation of the blood, as increasing the proportion of serum does.

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## ART. VI.—*A Concise View of the Progress of Military Medical Literature in this Country; being a Chronological Arrangement of Authors, with Critical Remarks on their Works.* By JAMES IRVING, M. D. (Continued from Vol. lxiv. p. 129.)

1802. Observations on the Acute Disease of Egypt called Ophthalmia. By F. B. Spilsburg, Staff-Surgeon. London, 8vo.

1802. An Account of the Ophthalmia which appeared in the 2d regiment of Argyleshire Fencibles in the months of February, March, and April 1802; with some Observations on Egyptian Ophthalmia. By Arthur Edmonston, M. D., Surgeon to the Regiment. London, 8vo.
*Reviewed.*—British Critic, vol. xx. p. 323.

1803. An Attempt to investigate the Causes of Egyptian Ophthalmia; with Observations on its Nature and different Modes of Cure. By George Power, Assistant-Surgeon 23d Regiment. London, 8vo.

The three last-mentioned pamphlets relate to a form of ophthalmia which prevailed to a serious extent among the British troops in Egypt; and which has been variously termed *ophthalmia gravis,* purulent ophthalmia, and Egyptian ophthalmia. Mr Power having accidentally discovered in his own case the advantage of employing opium, assures us, in reference to a trial made at the hospital at Ghiza, that in the space of a month from the adoption of this remedy, he was enabled to restore to the army almost every ophthalmic patient in a state either of convalescence or of perfect health.

1803. Observations on Diarrhœa and Dysentery, as those diseases appeared in the British Army during the campaign in Egypt in 1801. To which is prefixed a description of the climate of Egypt, and a Sketch of the Medical History of the Campaign. By Henry Dewar, M. D. London, 8vo.

Dr Dewar gives an account of the history, pathology, and treatment of two diseases which prevailed to a great extent among the British troops in Egypt. In addition to his own observations, he states fairly the opinions and practice of others. It is much to be regretted that we have no full account of the health of the army during the Egyptian campaign. This author has indeed given, in a few pages, a slight sketch of the medical history, which however he admits to be very imperfect and even erroneous, if applied to the whole army, since he had little opportunity of knowing the state of any regiments except the 30th and 89th; in the former of which he was assistant-surgeon. Dr Dewar, whose original name was Fraser, was a man of talents, and of varied knowledge. He afterwards settled in Edinburgh as a physician and private lecturer, and died in consequence of puncturing one of his hands when in the act of dissecting a morbid subject.

*Reviewed.*—Annals of Medicine, vol. viii. p. 44.

1804. Medical Sketches of the Expedition to Egypt from India. By James M'Gregor. London, 8vo.

Sir James M'Grigor was principal medical officer of the reinforcement sent by the Indian government to the assistance of the British army in Egypt; and in this little work he has embodied the result of the information communicated to him through the reports of the other medical officers. Hence, the work being founded on extensive and authentic data, is one of importance. It is also valuable as containing the fullest notice which we possess respecting the medical history of the campaign; together with observations on the health of a considerable body of Sepoys, exposed to a much colder climate than their own. The Medical Sketches were originally drawn up by desire of the Court of Directors, and consist of three parts. The first contains a journal of the expedition; the second relates to the causes of the diseases prevalent in the Indian army; and the third contains practical observations on the prevailing diseases. This last subject is discussed under two heads. The first head relates to the endemic diseases of Egypt, namely, plague and ophthalmia. Under the second head are discussed the other diseases of the Indian army, such as fever, hepatitis, dysentery, pneumonia and rheumatism, small-pox, diarrhœa, scurvy, syphilis, guinea-worm, ulcers, tetanus; and subjoined are some general remarks on the yellow fever, and the resemblance which it bears to plague.

*Reviewed.*—Monthly Review, vol. xlviii. p. 385. British Critic, vol. xxiv. p. 123.

1803. Remarks on the Constitution of the Medical Department of the British Army, with a Detail of Hospital Management; and an Appendix attempting to explain the Action of Causes in producing Fever, and the Operation of Remedies in effecting Cure. By Robert Jackson, M. D. London, 8vo.

The first and second parts of this work contain strictures on the constitution of the medical department of the army, with remarks on the mode in which the hospital of the army depôt in the Isle of Wight was conducted while under the charge of the author. Dr Jackson takes an enlarged and liberal view of the subject, and strongly contends for the principle of holding out the inducements of rank and emolument to those who may enter the public service. At the same time that these inducements are offered, he proposes to raise the standard of qualifications required of candidates for admission; and recommends that they should be sent for a year to a military medical establishment, in order to receive practical instructions in the diseases most common to armies in Europe and in tropical climates; and to acquire information regarding the economy and management of troops, and the superintendence of hospitals. The third part is occupied in answering a charge brought against the author by the physician and surgeon-general, in a letter to the secretary at war, in which it was asserted that in the hospital entrusted to the care of Dr Jackson, there had occurred an unprecedented number of deaths, frequent relapses, slow recoveries, and a debilitated state of the patients from the peculiar treatment employed. A special board appointed to inquire into the truth of the charge, fully exonerated him from any blame. The appendix, which occupies nearly half the volume, relates to his favourite subject, fever.

*Reviewed.*—Monthly Review, vol. xlvi. p. 20.

1804. Chirurgical Institutes drawn from Practice, on the Knowledge and Treatment of Gunshot Wounds: illustrated with some singular Cases and Cures of gallant Warriors. By H. St John Neale. London, 8vo.

These Institutes are the result of Mr Neale's experience during the American war, when he served as surgeon to the 5th regiment of Foot and the 16th regiment of Light Dragoons. The plan of the work is first to treat of gunshot wounds in general, and next of gunshot wounds of particular parts. He abounds in hypotheses, and adopts the doctrines of the humoral pathology. He recommends almost all gunshot wounds to be dilated; thus inculcating a practice which compels a man to be "cut because he had the misfortune to be shot." In the medical treatment of these wounds he prescribes bark, and "that divine remedy opium" in very large quantities, and becomes extravagant in his commendations of these remedies.

*Reviewed.*—Monthly Review, vol. l. p. 395. British Critic, vol. xxiii. p. 677.

1804. A View of the Formation, Discipline, and Economy of an Army. By Robert Jackson, M. D. London, 4to.

This work is intended for military rather than medical officers, although to the latter also many hints are addressed. It contains sketches of the military character of the different descriptions of men of which the British army is composed. Sir John Moore thus alludes to it in a letter addressed to the author: "I have perused your military book, with which I am much delighted. There are none of us, even the most experienced, who may not derive instruction from it; and I only regret that you who possess a soldier's mind had not been a soldier by profession."

*Editions.*—Lond. 1804, 4to. 1824, 4to.

1805. A System of Arrangement and Discipline for the Medical Department of Armies. By Robert Jackson, M. D., London, 8vo.

The object of this publication is twofold; 1. to expose several alleged anomalies and abuses in the medical department of the British army, and to point out a method of correcting or amending them; 2. to be a guide to young medical officers, by showing their duties, and making them acquainted with some of the usages of the service. His remarks relate more particularly to the medical staff, to hospitals, and to their medical and economical management. Many of the improvements here proposed were afterwards adopted.

*Reviewed.*—Lond. Med. and Phys. Journ. vol. xiv. p. 547.

1805. A Collection of Treatises on the Effects of Sol-Lunar Influence in Fevers and other Diseases. By Francis Balfour, M. D. Calcutta.

Dr Balfour, who was first member of the Bengal Medical Board, gives us these treatises, most of whose titles have already been mentioned, as the result of thirty-six years' experience in India. The doctrine of sol-lunar influence, and the opinions of this writer will be best explained in the words of Dr Good, (Study of Medicine, vol. ii. p. 109, second edit. Lond. 1829, 4 vols. 8vo.) "In ancient times the heavenly bodies, and especially the sun and moon, were supposed to influence all diseases, but particularly mania and epilepsy. When the Newtonian doctrine of universal attraction was first promulgated, Dr Mead revived and supported the ancient doctrine with great learning and ingenuity. It was regarded merely as an ingenious conjecture and possible fact, till Dr Darwin, by interweaving it with his peculiar doctrines, once more endeavoured to give it an air of serious importance. Dr Balfour brought it forward as capable of direct proof. His opinion is, that the influence of the sun and moon, when in a state of conjunction, which is named sol-lunar influence, produces paroxysms in continued fever in all cases in which a paroxysmal diathesis exists; and as this influence declines, in consequence of the gradual separation of these luminaries from each other, and then getting into opposition, a way is left open to the system for a critical and beneficial change. Dr Stoker put Dr Balfour's doctrines to the test of 276 patients between 6 July and 6 September 1817 in Dublin. He has given us his tables, and observes, that 'very little coincidence indeed is to be remarked from a view of these tables.'" (Trans. of King's and Queen's Col. Dub. vol. ii. p. 435.) The abundant evidence so carefully collected from all quarters by Dr Balfour is sufficient to show, that in India at least the existence of this influence cannot be reasonably doubted, although it may not be so evident in this country either in the case of insanity or fever. He also claims the "merit of being the first who publicly and professedly contended that the *gonorrhœa virulenta* is a disease totally distinct in its nature from the *lues venerea*, and does not require mercury for its cure." Had he lived to the present day, he might have arrived at the conclusion, that even true *lues venerea* does not require mercury for its cure.

*Editions.*—Calcutta, 1805. Lond. 1812, 8vo. Cupar, 1815, 8vo. Cupar, 1816, 8vo.
*Reviewed.*—Monthly Review, vol. lxviii. p. 97.

1806. A Practical Account of a Remittent Fever frequently occurring among the Troops in this Climate. By Thomas Sutton, M. D. London, 8vo.
*Reviewed.*—Monthly Review, vol. xlix. p. 432.

1806. Notes on the West Indies, written during the Expedition under the command of the late Sir Ralph Abercromby; including Observations on the Island of Barbadoes, and the settlements captured by the British Troops upon the coast of Guiana; likewise remarks relating to the Creoles and slaves of the Western Colonies, and the Indians of South America; with occasional hints regarding the Seasoning or Yellow Fever of Hot Climates. By George Pinckard, M.D. London, 3 vols. 8vo.
*Reviewed.*—Monthly Review, vol. liii. p. 169.

1806. A Treatise on the Varieties and Consequences of Ophthalmia; with a preliminary Inquiry into its contagious nature. By Arthur Edmonston, M. D. Edinburgh, 8vo.

The preliminary inquiry gives the result of diligent researches regarding the contagious nature of ophthalmia, more especially the Egyptian variety; a doctrine which he has the merit of having first brought prominently forward, and to which he also alluded in his publication of 1802. He states such facts as had fallen under his observation, and endeavours to confirm his opinions by quotations from ancient and modern authors. Dr Edmonston afterwards published an elaborate and valuable work, which, although of a very different description, likewise contains some contributions to the general stock of medical information.*

*Reviewed.*—Edin. Med. and Surg. Journ. vol. iii. p. 211.

1807. An Account of the Ophthalmia which has appeared in England since the return of the British Army from Egypt. By John Vetch, M. D. London, 8vo.

Dr Vetch's remarks chiefly refer to the disease as it appeared in the 2d battalion of the 52d regiment, in which he had been assistant-surgeon. We here find a clear account of the contagious origin of the disease, of its subsequent history, of its symptoms and treatment. With Dr Vetch and Mr Peach, the surgeon of the regiment, originated the method of treatment by very copious general blood-letting, which was only to be stopped when the pain was diminished or the vascularity of the conjunctiva appeared less.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. iii. p. 360. Monthly Review, vol. lv. p. 39.

1807. An Essay on Ophthalmia; containing a History of that Disease as it appeared in the 1st battalion 89th Regiment; with some observations on its causes and symptoms; also the medical treatment, &c. which have been crowned with unparalleled success. By Henry Reid, Surgeon to the Regiment. London, 8vo.

1808. Suggestions for the Prevention of that insidious and destructive foe to the British Troops in the West Indies, commonly termed the Yellow Fever; with an outline of a Plan of Military Hospitals, on a principle and construction tending to introduce a more successful treatment of the sick. To which are added other papers connected with the subject. By Stewart Henderson, M. D. Birmingham, 8vo.

Dr Henderson was formerly a surgeon in the navy, but afterwards entering the army, served as regimental surgeon, as apothecary to the forces, and as district staff-surgeon. The object of his Suggestions is to show that attacks of yellow fever are chiefly confined to the robust and plethoric, and to recommend that therefore the vigour of young soldiers who have not before been abroad should be reduced during the voyage by means of a course of mercury, so as to produce that laxity of structure found in *acclimatés*. The principal novelty of his plan for military hospitals is, that it allows each patient a separate room, 7 feet by 8, and 40 feet high.

*Reviewed.*—British Critic, vol. xxxiii. p. 416.

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* A View of the ancient and present State of the Zetland Islands. Edin. 1809, 2 vols. 8vo.

1808. The Chirurgical Candidate; or, Reflections on the Education indispensable to complete Naval, Military, and other Surgeons; and on the Yellow Fever of the West Indies. By Charles Dunne. London, 8vo.

1808. The Fifth Report of the Commissioners of Military Inquiry. On the Army Medical Department. (H. of Commons Papers.) London, fol.

1808. A Letter to the Commissioners of Military Inquiry, containing animadversions on their Fifth Report, and an Examination of the principles on which the Medical Department of Armies ought to be formed. By E. N. Bancroft, M. D. London, 8vo.
*Reviewed.*—Monthly Review, vol. lvii. p. 313.

1808. A Letter to the Commissioners of Military Inquiry, in reply to Dr E. N. Bancroft. By James Macgregor, M D. London, 8vo.
*Reviewed.*—Monthly Review, vol. lvii. p. 313.

1808. A Letter to the Commissioners of Military Inquiry, explaining the true Constitution of a Medical Staff, the best form of Economy for Hospitals, &c.; with a refutation of errors and misrepresentations contained in a letter by Dr Bancroft, Army Physician, dated April 28, 1808. By Robert Jackson, M. D. London, 8vo.
*Reviewed.*—Monthly Review, vol. lvii. p. 430.

1808. An Exposure and Refutation of various Misrepresentations of Dr J. Macgregor and Dr Jackson in their Letters on Medical Arrangements for Armies, &c. By E. N. Bancroft, M. D. London, 8vo.

*Reviewed.*—Monthly Review, vol. lvii. p. 433.

1808. A Letter to Mr Keate, Surgeon-General of the Army. By Robert Jackson, M. D. London, 8vo.
*Reviewed.*—Monthly Review, vol. lvii. p. 432.

1808. Observations on the Fifth Report of the Commissioners of Military Inquiry, and more particularly on those parts which relate to the Surgeon-General. By Thomas Keate, Surgeon-General. London, 4to.

1808. Candid Appeal to the British Public; containing his remonstrance to H. R. H. the Duke of York concerning the Army Medical Department. By John Buffa, M. D. London, 8vo.

1808. Second Letter to the Commissioners of Military Inquiry, containing a Refutation of some Statements made by Mr Keate, Surgeon-General. By Robert Jackson, M. D. London, 8vo.

1808. Proceedings and Report of a Special Medical Board appointed by H. R. H. the Commander-in-Chief and the Secretary at War, to examine the State of the Hospital at the Military Depôt in the Isle of Wight. London, 8vo.

1809. Observations on the Proceedings and Report of the Medical Board appointed to examine the State of the Army Depôt in the Isle of Wight. By Thomas Keate. London, 8vo.

1809. Observations on the Fifth Report of the Commissioners of Military Inquiry, and on the Army Medical Department. By A. Halliday, M. D. London, 8vo.

1809. A Letter to Sir D. Dundas, Commander-in-Chief of the Forces. By Robert Jackson, M. D. London, 8vo.

1809. A Letter to Dr Haygarth, exhibiting farther Evidence of the infectious nature of the Pestilential Fever of Grenada during 1793–6; and in America from 1793 to 1805 inclusive; in order to correct the pernicious doctrine promulgated by Dr E. Miller and other American physicians relative to this destructive pestilence. By Colin Chisholm, M. D. London, 8vo.
*Reviewed.*—Edin. Med. and Surg. Journ. vol. vi. p. 364.

1809. Observations on Egyptian Ophthalmia, and Ophthalmia Purulenta, as it has appeared in England. By William Thomas. London, 8vo.
Mr Thomas describes the disease as it fell under his observation in the Nottingham Militia and the 11th Royal Veteran Battalion. He considers Egyptian ophthalmia to be a disease essentially different from purulent ophthalmia.
*Reviewed.*—Monthly Review, vol. lvii. p. 319.

1810. Considerations respecting the Expediency of establishing an Hospital for Officers on Foreign Service; suggested by the Writer's experience during the late occupation of Walcheren. By A. B. Faulkner, Physician to the Forces. London, 8vo.
*Reviewed.*—Edin. Med. and Surg. Journ. vol. vi. p. 355.

1810. Observations on the Walcheren Diseases, which affected the British Soldiers in the Expedition to the Scheldt, commanded by Lieut.-Gen. the Earl of Chatham. By G. P. Dawson. Ipswich, 8vo.

This ill-concerted and unfortunate expedition proceeded from England in July 1809, and consisted of 1738 officers and 37,481 men. There were killed, 7 officers and 95 men; died abroad, 40 officers and 2041 men; while, from the return of the troops to the date of this publication, 20 officers and 1850 men had died; many more had their constitutions shattered, and were rendered unfit for service. When Mr Dawson wrote, he had been for three months in charge of a General Hospital at Ipswich, which had been appropriated to the sick returned from the Scheldt. He describes the continued and intermittent fevers, diarrhœa and dysentery, which there fell under his observation, and merely gives the result of his own experience, without referring to that of others.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. vi. p. 338.

1810. A Scientific and Popular Account of the Fever of Walcheren, and its consequences, as they appeared in the British Troops returned from the late Expedition; with an Account of the Morbid Anatomy of the Body, and the Efficacy of Drastic Purges and Mercury in the Treatment of this Disease. By J. B. Davis, M.D. London, 8vo.

The work under consideration contains observations made at the Hospital at Ipswich, to which the author had been appointed by the Medical Board, as temporary physician. In the introduction we are presented with a sketch of the medical history of the expedition, and of the medical topography of that territory. Dr Davis trusted chiefly to mercury and purgatives for the cure of the Walcheren fever; while, on the other hand, Mr Dawson reprobates the use of mercury.

*Reviewed.*—Edin. Med. and Surg. Journ., vol. vi. p. 338

1811. History of the Walcheren Remittent, commencing with its advanced stage, when most dangerous and destructive to the Soldiery, and concluding with its very favourable termination, effected by those means first proposed by the author only, to the Legislature and to the late and present Army Medical Board; with the morbid appearances on dissection; also the sequels, Anæmia, Acholia, Ægyptian Ophthalmia, &c. &c., elucidated by dissection. By Thomas Wright, M.D. London, 8vo.

Dr Wright had at this time been thirty years in the service. He gives the fullest account we possess of the Walcheren fever as it appeared at Harwich, where a temporary hospital had been erected for the troops returned from Flushing, and to which he was physician. In order to restore the convalescents to health, he proposed to send them to colonies where the climate was steady and temperate, as, for example, to Malta. Such is the essence of the plan "maturely proposed, and solely by the author," and which being adopted by Government, "restored so many of the best soldiers to health and to the service."

1810. An Analytical View of the Medical Department of the British Army. By Charles Maclean, M. D. London, 8vo.

This pamphlet is of a controversial nature, and is intended to expose the inefficiency of the system of medical management then followed, and the inefficiency of the members who composed the Medical Board. His exposure is founded on the Fifth Report of the Commissioners of Military Inquiry, on the publications to which that report gave rise, and on personal experience.

1810. Some Observations on Diseases chiefly as they occur in Sicily. By William Irvine, M. D. London, 8vo.

These observations were made by Dr Irvine when physician to the British Military Hospital at Messina. The book contains remarks on the climate of Sicily, on the different fevers of that island, on dysentery, phthisis, hepatitis, rheumatism, and erysipelas. In the fevers of Sicily, in which head-symptoms predominated, he was inclined to think that there was "an affection of the brain or of its vessels, which yields to treatment adapted to diminish local inflammation or excessive action;" and accordingly his practice chiefly consisted in the free abstraction of blood from the temporal artery, in blistering the head, and in the cold affusion.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. vii. p. 338.

1811. Observations on Ophthalmia and its Consequences. By Charles Farrel, M. D. London, 8vo.

This pamphlet contains the result of observations made when the author was with the army in Egypt and Sicily in the years 1808, 1809 and 1810, during the greater part of which time he had charge of an ophthalmic hospital.

1811. An Essay on the Disease called Yellow Fever; with Observations concerning Febrile Contagion, Typhus Fever, Dysentery, and the Plague; partly delivered at the Gulstonian Lectures before the College of Physicians in the years 1806 and 1807. By Edward Nathaniel Bancroft, M. D. London, 8vo.

Dr Bancroft was born in London; and, having studied medicine at London, Edinburgh, and Cambridge, he graduated at the latter university. In 1795 he was appointed Physician to the Forces, and in that capacity served in the West Indies, Portugal, the Mediterranean, Egypt, and England. In the first part of this essay, which consists of 811 pages, he gives an account of the history and treatment of yellow fever; but the greater part, comprehending upwards of 700 pages, is occupied with arguments and evidence in favour of the non-contagious nature of the disease; and with proofs of its origin from miasmata, and the effect of a tropical atmosphere on constitutions habituated to a cold or temperate climate.

But, on farther experience, he seemed inclined to distrust some at least of his opinions, as appears from the testimony of Dr Armstrong, who says,—" When I had the pleasure of his acquaintance in Jamaica, in 1827, 1828, and 1829, he was in practice as a physician at Kingston, and his opinions had undergone a change. I detailed to him certain experiments I had performed, and he stated more than once that he had spent many of the best years of his life in the West Indies, and was now more doubtful than ever whether any injurious exhalations arose from the soil; but he added, ' We cannot dispense with them, until you find something better to substitute.' "*

*Reviewed.*—Edin. Med. and Surg. Journ. vol. viii. p. 324.

1815. On Gunshot Wounds of the Extremities requiring the different operations of Amputation, with their after-treatment: establishing the advantages of amputation on the field of battle, to the delay usually recommended, &c. &c. &c. With four explanatory plates. By G. J. Guthrie. London, 8vo.

This work, which is considered a standard authority on gunshot wounds, contains the result of the experience gained by the surgeons of the British army during the Peninsular War. The author first introduces remarks on gunshot wounds; next on amputation in general; and then follow observations on particular amputations. The value of the work is enhanced by various reports of illustrative cases. Mr Guthrie affords much satisfactory information in reference to the treatment of gunshot wounds, the general question of amputation, the proper mode and time of operating, and to many other practical questions. In reference to the disputed point, as to the expediency of immediate or delayed amputation, he gives us some definite information, and tells us that in the Peninsular army the comparative loss in *secondary* or delayed operations and *primary* or immediate operations was as follows,—

| | Secondary. | | Primary. |
|---|---|---|---|
| Upper extremities, | 12 | to | 1 |
| Lower extremities, | 3 | to | 1 |

The merits of the whole question are very fully discussed, the objections urged against amputation on the field are examined and refuted; and by means of tables are shown the results of extensive experience of both methods. Some operations, before reckoned impracticable, are shown to be in several cases not only practicable, but proper; as, for example, amputation at the hip and shoulder-joint.

*Editions.*—London, 1815, 8vo. 1820, 8vo. 1827, 8vo.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. xii. pp. 220.

1815. Observations upon the Bulam Fever which has of late years prevailed in the West Indies, on the coast of America, at Gibraltar, Cadiz, and other parts of Spain; with a collection of facts proving it to be a highly contagious disease. By William Pym. London, 8vo.

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* Armstrong on the Influence of Climate on the Human Constitution, p. 41. London, 1823, 8vo.

Sir William Pym was at this period Deputy-Inspector of Hospitals, and had recently officiated as Superintendent of Quarantine and President of the Board of Health at Malta. His work refers to the much-contested question as to the origin of the fever which prevailed in the West Indies in 1793, and was supposed by some to have been introduced from Africa. It is well known that this controversy was carried on with great keenness on both sides, and led to much bad feeling and unprofitable discussion; while the result has been, that the point is still left undecided, and our knowledge of the treatment of the disease has not been advanced a single step. Sir W. Pym's object is to prove that this fever is of a highly contagious nature, and differs from the common yellow fever of the West Indies; that it attacks the human frame but once; and that its contagious properties are increased by heat, but destroyed by cold. With the view of proving these positions, he brings forward his own and the experience of other medical officers who had seen the disease in various parts of the world; and takes to task those who had ventured to hold an opposite opinion, more especially Dr Bancroft, whose facts he questions, and whose arguments he endeavours to refute.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. xi. p. 383.

1815. Reports on the Pestilential Disorder of Andalusia, which appeared at Cadiz in the years 1800, 1804, 1810, and 1813; with a detailed Account of that fatal Epidemic as it prevailed at Gibraltar, during the autumnal months of 1804; also Observations on the Remitting and Intermitting Fever, made in the Military Hospitals at Colchester after the return of the Troops from the Expedition to Zealand in 1809. By Sir James Fellowes, M. D. London, 8vo.

These Reports are five in number. The first refers to the fever of Cadiz in 1800; the second to that of Gibraltar in 1804, and of Malaga in 1803 and 1804; the third to the epidemic at Cadiz in 1810; the fourth to that which occurred at the same place in 1813; and the fifth report contains observations on the diseases of the troops returned from Walcheren, which were treated at Colchester in the year 1809. He gives histories of those different epidemics, furnishes us with sketches of the medical topography of Cadiz and Gibraltar, and illustrates his subject by frequent references to the works of the Spanish physicians. He strenuously opposes the opinions of Dr Bancroft, and maintains that yellow fever is contagious.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. xii. p. 109.

1816. Observations and Inquiries into the Nature and Treatment of the Bulam Fever in Jamaica and at Cadiz, particularly in what regards its primary cause and assigned contagious powers; illustrated by cases and dissections, with a view to demonstrate that it appears divested of those qualities assigned to it by Mr Pym, Sir J. Fellowes, and others. In a series of Memoirs. By Edward Doughty. London, 8vo.

This book is divided into three parts; the first relating to the fever of the West Indies, the second to that of Cadiz in the year 1810, and the third containing a recapitulation of the doctrines advanced in the former parts. The author's opportunities for studying the subject were ample. He had served ten years in the West Indies, was a staff-surgeon in Lord Lynedoch's expedition to Zealand, and was at Cadiz during the epidemic of 1810. His observations are more particularly of a controversial nature, intended to prove that yellow or Bulam fever is of a non-contagious nature; and with the view of establishing this opinion, he has not brought forward the evidence of others, as had been done before by Dr Bancroft, but simply adduces such evidence as had fallen under his own cognisance. He believes that the general cause of this fever is a particular quality of the earth, and that marine exhalations or marsh miasmata are not necessary to explain its source. We also find notes on the treatment, and several cases and dissections in support of the author's opinions. Having applied to his superior, Sir J. Fellowes, for permission to open a body, he received a refusal, and in a moment of irritation expressed himself too warmly, and in a manner incompatible with military decorum. The result was that he was brought to a court martial and dismissed the service; but through the liberal influence of the Duke of York, he was restored to his former rank.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. xiii. p. 238.

1816. Medical, Geographical, and Agricultural Report of a Committee appointed by the Madras Government to inquire into the Causes of the Epidemic Fever which prevailed in the Provinces of Coimbatore, Madura, Dindigal and Tinnivelly, during the years 1809, 1810, and 1811; of which Dr Whitelaw Ainslie was president, Mr A. Smith second member, and Dr M. Christy third member. London, 8vo.

This report, which appears to have been prepared with much care, contains some interesting information regarding the common jungle or hill fever of India, which raged epidemically in the Madras presidency for several years, and caused the death of no less than 106,789 persons, besides "ruining the constitutions of many thousands." The principal topics discussed are, the medical topography of the provinces in which the fever prevailed; the history of the rise and progress of the epidemic; its causes; its nature; its treatment; and, in conclusion, the probable means for preventing a similar recurrence.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. xiii. p. 76.

1816. Report of Observations made in the British Military Hospitals in Belgium after the Battle of Waterloo; with some Remarks on Amputation. By John Thomson, M. D. Edinburgh, 8vo.

Dr Thomson was at this time Regius Professor of Military Surgery in the University of Edinburgh, and he was soon afterwards appointed Surgeon to the Forces. On the state of the wounded, he gives the result of observations made in the hospitals of Antwerp and Brussels, during a visit which he paid to the continent, a few days after the battle of Waterloo. He successively treats of the general state of the wounded; of the different kinds of wounds, those of the head, of the face and neck, of the chest, of the abdomen, of the loins and pelvis, of the upper and lower extremities; and of amputation. The chapter on amputation contains much interesting information in reference to the history of the operation, and much practical instruction in reference to the mode of performing it.

1817. Commentariolum, quædam de Dysenteria, Febribus intermittentibus ac remittentibus medendis, complectens, Exercitus castrenses per certas anni tempestates potissimum infestantibus. Auctore E. S. Somers, M. D. Edinburgi, 8vo.

1817. A Sequel to the Essay on the Yellow Fever; principally intended to prove by incontestable Facts and important Documents, that the Fever called Bulam or Pestilential has no existence as a distinct or a contagious disease. By Edward Nathaniel Bancroft, M. D. London, 8vo.

This is another of the works on the controversy regarding the origin of yellow fever. It was published in consequence of what had been stated by Sir W. Pym and Sir J. Fellowes, as to the opinions of Dr Bancroft, who here produces additional facts for the purpose of refuting those authors, and supporting the speculations contained in his previous work.

1817. A Sketch of the History and Cure of Febrile Diseases, more particularly as they appear in the West Indies among the Soldiers of the British Army. By Robert Jackson, M. D. Stockton, 8vo.

*Editions.*—Stockton, 1817, 8vo. Lond. 1820, 2 vols. 8vo.

1818. Observations on some important points in the Practice of Military Surgery, and in the Arrangement and Police of Hospitals. Illustrated by Cases and Dissections. By John Hennen. Edinburgh, 8vo.

The object of this publication will be best explained in the author's own words:—"At the termination of a series of wars, which, for a large portion of a century, have desolated the fairest regions of the European world, and drenched their fields in blood, the medical philanthropist will naturally ask what results have accrued from such ample sources of experience? What progress has been made in softening the miseries of pain and disease, and in extracting from such multitudes of victims antidotes to the waste of human life? The younger practitioner, also, who may enter the service of his country, will inquire, where am I to collect the fruit of that experience with which so many campaigns have enriched my predecessors? And how, if the opportunities come within my reach, am I best to avail myself of them? It is in some degree to answer these interrogatories that I have ventured to make the following observations." In the prosecution of his plan, he freely avails himself of the written and oral testimony of British and foreign army surgeons, and faithfully narrates what he saw during the eighteen years of his service. He brings the young surgeon at once into the field of battle;—details the necessary preparations for a campaign or engagement;—makes many practical observations on the various injuries likely to occur;—and in illustration of his views or method of treatment, details numerous cases nearly in the same words in which they were taken down at the time in the hospital-register, or in his private case-book.

*Editions.*—Edin. 1818, 8vo. Edin. 1820, 8vo. Lond. 1829, 8vo.

*Reviewed.*—Edin. Med. and Surg. Journ. vol. xiv. p. 370, vol. xvi. p. 447.

1818.—Observations on Phagedena Gangrenosa. In two parts. I. The History of the Disease deduced from observations and experience, and containing a simple and effectual Method of Treatment. II. An Investigation into the History of the Disease, as it is to be found in the writings of various ancient and modern authors. By H. Home Blackadder. Edinburgh, 8vo.

Mr Blackadder gives the result of observations on this disease made in one of the British military hospitals at Passage in the province of Biscay during the Peninsular war. He supports the opinion that phagedena gangrenosa, or hospital sore, is a disease of a strictly local character; and accordingly, in the cure, he places his chief reliance on topical remedies.

*(To be continued.)*

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## ART. VII.—*Historical and Critical Remarks on the operations for the cure of Cataract.* By ALEXANDER WATSON, M. D. F. R. C. S. E., Consulting Surgeon to the Royal Infirmary, and Surgeon to the Eye Infirmary, Edinburgh.

### OF THE OPERATION FOR CATARACT BY EXTRACTION.

### § 1. *History of Extraction.*

One hundred years having now elapsed since the operation for the cure of cataract, by the extraction of the crystalline lens, was first practised, it may neither be uninteresting nor useless to take a brief retrospect of the success which has attended this operation.

The introduction of this operation as a mode of curing cataract, forms one of the most interesting epochs in the history of ophthalmic surgery. This was indeed a brilliant achievement, accomplished by the introduction of one of the most perfect and beautiful operations of which surgery can boast,—an operation, too, for the cure of one of the most grievous privations to which humanity is subject.

During many preceding ages, the depression or couching of the opaque lens within the eye, so as to remove it from the axis of vision, had been extensively practised in Eastern countries, as well as in Europe, although the anatomy of the eye was, at that period, very imperfectly understood.

In more recent times, the world has been indebted to England for another mode of cure,—that by the solution of the cataract within the eye, effected by the action of the aqueous humour upon the lens when divided into fragments.* The merit of this operation is due to the late Mr Pott of London. It has since been improved and perfected by the late Mr Saunders.

The introduction of the operation for cataract by extraction is generally conceded to Daviel, a surgeon of Marseilles in France. According to his own account, some of the ancients had conceived the practicability of extracting membranous cataracts through the cornea. In later times, an opening had been made through the cornea, for the purpose of extracting the crystalline lens from the anterior chamber of the aqueous tumour, when it had accidentally got into that situation. Such operations had been performed both by St Yves and Petit in the years 1707–8. About the year 1744, a similar case having occurred to Daviel, he was led by their example (he acknowledges) to operate in the same manner. And subsequently to this, from a want of success in his operations for cataract by couching, he resolved to try the expediency of extracting the opaque lens from the eye, by an operation somewhat similar to that of St Yves and Petit.

In making this attempt and bringing the operation into form, Daviel seems to have been occupied for several years, from 1744 to 1747. And it was not until the year 1753 that he published to the world his adaptation of this operation to the cure of cataract.†

The merit of Daviel, therefore, in regard to this operation consisted, in proposing and demonstrating the practicability of its success for the cure of cataract. The instruments he used for this purpose may now be considered clumsy and imperfect; and, although it was reserved for the ingenuity of his followers, and the experience of after times, to bring this operation to its present state of perfection, still to the genius, skill, and dexterity of Daviel we are indebted for this beautiful triumph of art,—the *chef-d'œuvre* of surgery.

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* See Pott's Surgery, also Saunders on the Eye.

† Mem. de l'Acad. de Chir. T. ii. Paris, 1753.

This novel operation for the cure of cataract by extraction, such as it was in the hands of Daviel, having been followed by much greater success than couching, he resolved in 1750 to continue to practise it; and, since his account of it was published, as already stated, it has been adopted by others as one of the regular operations of surgery.

In order to extract the opaque lens from the eye, Daviel made an opening or puncture through the cornea with a lancet-shaped knife; which opening he enlarged to the proper size by means of scissors. He then divided the anterior part of the capsule and scooped out the lens with a small sharp-pointed instrument. He afterwards improved the operation, by substituting a small blunt-pointed knife, to enlarge the puncture of the cornea, for the scissors.

This operation,—in its nature so perfect, and in its object so important, was happily destined to undergo rapid advances in improvement towards perfection.

The first great improvement made upon the operation was that of making the opening in the cornea, through which the lens was to be extracted, by one incision with a knife adapted to the purpose, instead of Daviel's more complex mode. This seems to have been first done by Pallucci and La Faye in Paris 1752.* This mode of operating has since continued to be practised as the best; and, although the operation, in different countries, has been subjected to every change and modification which ingenuity could devise, scarcely any improvement upon it has been made. Nor can we conceive how the operation could be performed in a manner more perfect,—with more simple instruments,—or with less injury to the eye, than when it is effected by an incision of the cornea made at once, followed by a puncture of the capsule of the lens, without any other injury being done to the eye. What is wanted now, therefore, is, instruments of a proper size and form, guided by the dexterous and steady hand, united to skill and experience.

During the hitherto short career of this operation, it has been subjected to a greater variety in the form of the instruments employed than any other operation in surgery. In the small work of Lachmann, already referred to, upwards of eighty different instruments are described and delineated, as having by different individuals been employed for making the section of the cornea, to which several others might now be added. These vary from the simple narrow knife, to the complicated phleme-shaped lancet projected from its concealment with a strong spring. The invention of the multiplicity of instruments here alluded to, has obviously arisen from a desire to render an operation more easy, which was found to be attended with difficulty in its execution,—to accomplish by instruments that which can only be done by manual dexterity,—to make up what is wanting in dexterity by mechanical contrivance,—an object which has not, in this case, been attended with success.

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* Fig. 1. See Lachmann, de Historia Instrumentorum.

The extraction of cataracts has been very successfully practised by many distinguished surgeons; in particular I may mention the familiar names of Richter,* Wenzel,† Barth,‡ Beer,§ and Ware,|| who, though they lived in times now gone by, have left behind them lasting testimonials of their high talents, dexterity, and well-earned reputation.

These very celebrated operators performed this operation with instruments very similar to each other; the chief of which is the knife for making the section of the cornea. The knife employed by Richter, Wenzel, and Ware, was nearly the same in form, and such as had been previously in use by others. (Plate II. Fig. 2.) But Barth was the first to make a modification of this knife, which has been considered to be an improvement so great, that it has been generally adopted since his time. (Fig. 3.) As he died without having published any description of the instrument or operation, this was afterwards done by his successor Beer, under whose name the knife is now generally known.

### § 2. *Success of the operation by Extraction.*

Let us now inquire into the success with which this operation has been practised,—considered *per se*, and also in comparison with that of couching.

It is very desirable that some tolerably correct account of this could be made. But from the want of accurate data it is impossible, I apprehend, to do more than to give the opinions of some of the most distinguished surgeons upon the subject; for, several of the greatest operators, such as Richter, Barth, Wenzel, Ware, and others, have not left on record any detailed account of their cases or the success of their operations. Hence, the statistical accounts of the success of this operation, which have been attempted, have been extremely imperfect.

When Daviel wrote an account of this operation, he mentions his having then practised it on 206 cases of cataract, of which 182

* Richter de Extract. Catar. Gottin. 1770.

† Description détailée de l'instrument, &c. Paris, 1786.

‡ First Professor of Ophthal. Surgery at Vienna, 1795.

§ Treatise on Ophthalmology. Vienna.

|| Treatise on Cataract. London, 1795.

were successful. This success was the more remarkable, that he operated with very imperfect instruments which were not well adapted to the purpose, and probably did not make any particular selection of his cases.

In consequence of the success of the other distinguished operators I have mentioned, they severally became strong partizans in favour of this operation in preference to couching. From their experience, therefore, as well as from that of others under similar circumstances, we cannot expect an unbiassed opinion in regard to the comparative merits of these two operations. But this much we may infer, that the extraction of cataract is an operation which has been, and therefore may be, eminently successful; so that when we find others depreciating it, we may conclude that they did not possess the manual dexterity necessary for its successful performance. The converse of this may also be asserted; namely, that all those who have been able to perform this operation successfully have become advocates in its favour, though very properly, not always to the exclusion of other operations. I may also remark further that, the most successful operators always used the simplest instruments in performing this operation.

At the school of ophthalmology in Vienna, where Barth was the first professor, and which has now become the most celebrated in Europe, such has been the attention bestowed upon this operation by Barth, Beer, and their successors, and such the expertness and success with which it is practised, that it is always esteemed to be the most desirable operation for cataract, if no circumstances exist, in particular cases, to contra-indicate it.

Extensive experience of this kind, in the hands of such eminent individuals as Barth, Beer, Rosas and Jaeger, certainly speaks volumes in favour of this operation. In Germany cataract appears to be a more common disease than it is in this country, so that extraction and other operations for its cure are practised in Vienna and in other parts of Germany upon a very considerable scale, and that of extraction, in particular, with almost uniform success. This shows (as I shall afterwards have occasion to mention more fully) what may be done by the experience which extensive practice affords, combined with minute attention to the details of the after treatment.

The most celebrated operators for cataract, who have practised in England since the operation by extraction was first introduced, have shown a decided preference by their adoption of it where the cases were favourable. Among those to whom I allude may be enumerated Ware, Phipps, Sharp, Adams, Alexander, Lawrence, Wardrope, Travers, Guthrie, and Tyrrell. The published opinions of some of these upon this point we shall now quote.

"The operation of extraction," says Mr Travers, "is by far the most perfect ever devised for the cure of cataract. * * When the operation is perfect, its pre-eminence is too conspicuous to admit of illustration. It exacts the homage of admiration beyond any other effort of art."*

"The operation of extraction is particularly applicable to cases of firm cataract, especially in persons advancing in years. * * The advantages of the operation are the complete removal of the cataract, and the speedy restoration of sight."†

"The result of the operation of depression has not, under my observation, been so successful as extraction; for which reason I adopt the latter, when the case admits of it, in preference to the former."‡

"The operation of extraction," says Mr Guthrie, "or the removal of the opaque lens and part of the capsule from the eye, is a radical cure of the complaint, as it cannot possibly return. It is performed in a very short space of time, and, when completely successful, causes the least disturbance to the internal parts of the eye, and is the most certain of all the methods recommended for restoring vision in this disease."§

Dr Mackenzie of Glasgow states it as his opinion, that "extraction is the only proper mode of removing a hard cataract."‖

These are the opinions of the most eminent surgeons in this country on the subject; and, they are of the greater weight that, these gentlemen do not operate exclusively by extraction, but perform the other operations with equal success, in cases where this is proper; for, as Mr Lawrence justly remarks, "no person, who understands the subject, would advise any one operation to be employed exclusively."

The chief objections to the operation for the extraction of cataract arise from the difficulty of performing it; and, therefore, apply to the operator rather than to the operation; for while the operation is, in its nature, simple, obvious, and effectual, it is requisite for the operator to possess several rare qualifications, which are not often combined in one individual. These are, skill, dexterity, and experience.

To those who have seen this operation well executed, but never performed it themselves, the difficulties attending it may appear to be exaggerated. But, on trial, they will soon find that the statements of practical surgeons on this point are well founded and correctly stated.

In regard to the difficulty of the operation, Mr Travers says, "No operation in surgery, I am well satisfied, requires an equal degree of temper and experience for its accurate and successful performance." He then shows that the chief objections which have been urged to the operation apply rather to the performance than to the principle of it.

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* Travers on the Eye, p. 322 and 332.

† Lawrence on the Eye, p. 634.

‡ Tyrrell on the Eye, vol. ii. p. 447.

§ Guthrie's Lectures on the Oper. Surg. of Eye, p. 365.

‖ Mackenzie on the Eye.

"Another objection to the operation of extraction," says Mr Lawrence, "has reference rather to the operation (operator?) than to the patient; it is the difficulty of performing it,—the degree of manual dexterity required for its successful execution. Unless a person has frequent opportunities of operating, he will not become familiarised to the various difficulties of the proceeding, nor acquire that confidence which is essential to success. The unsteadiness of the eye, the little control which the patient has over it, the alarm which the dread of the operation, and still more the preliminary measures, occasion, and the convulsive or spasmodic exertion which the actual contact of the instrument often excites, are sources of real difficulty."*

"The operation of extraction," says Mr Tyrrell, "which is best adapted to a very large proportion of the cases of hard cataract, is so difficult of performance, and requires so much experience in ophthalmic operations, besides an unusual extent of manual dexterity, that very few can perform it well, and with confidence."†

"Now, then, the extraction of the lens," says Mr Abernethy, "is a very difficult operation, very difficult. If a man sets about it hesitatingly he makes some blunder or another; and, therefore, it is an operation which always should fall to the lot of surgeons who have been in the habit of practising it."‡

The chief obstacles to success and dangers of this operation, therefore, resolve themselves into the difficulty of its execution. But this is far from being insurmountable by attention and experience. A careful study of the subject, and assiduous practice on the dead body, followed by experience on the living, are necessary for acquiring that degree of skill and dexterity which are requisite for performing this operation with success; but which, (as has been stated above,) may by labour and diligence be attained, as it has been, by many celebrated operators.

### § 3. *Of the performance of Extraction of Cataract.*

From what has been above stated, and the high authorities which have been quoted, the surpassing excellence of this operation must be obvious. But although much has been written in praise of the operation, all its advocates admit the difficulty which attends the execution of it.

This difficulty arises from the mobility of the eye, which the patient cannot control,—the very minute and limited space for the operation,—the great delicacy of the parts which are so easily destroyed by pressure or rash manipulation,—the number of circumstances requiring the operator's attention during the different stages of the operation,—the dexterous and skilful movement of the knife that is necessary in making the section of the cornea,—and the difficulty of making the incision of the exact size that is requisite. To sum up all, we may quote, as peculiarly applicable to this operation, what Mr Liston has said regarding the performance of operations on the eye generally; namely, that "the operator must have a good eye; a steady, light, and skilful hand; a fine touch; courage and caution,"—qualifications necessary in addition to steadiness, composure, and calmness, on the part of both patient and surgeon, in order to secure success.

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* Lawrence on the Eye, p. 635.

† Tyrrell on the Eye, p. 481.

‡ Lectures, Lond. 1828, p. 531.

Although the facility, the exactness, and the success of this operation depend much on skill and dexterity in performing it, still, much also depends on the form of the instruments employed for the purpose.

In consequence of the almost unvarying form and size of the parts concerned, the best form of instruments may be ascertained by mechanical principles. By then combining the results of theory and experience, the proper form of the instruments may be fixed and established.

The object of the operation being to extract the opaque crystalline lens from the eye, through an opening made in the transparent cornea, with the least possible injury to the eye, the mechanical proposition here concerned is, to ascertain the exact form of knife best suited for making the requisite incision of the cornea.

Having the form, size, and relative position of the parts concerned in the operation fixed, as also the best form and situation for the requisite opening established by experience, it is easy to ascertain the best form and size of the knife to be used.

Let it be assumed that the size and form of the incision requisite to be made is nearly one-half of the circumference of the cornea, as is shown in figure 10, *b f b*, of the annexed plate. Now, the average diameter of the cornea, from *a* to *a*, is $\frac{9}{20}$ths of an inch. Hence, the extreme breadth of the knife required to divide somewhat more than one-half of the cornea, (from *e* to *f*,) by transfixing it, is a quarter of an inch. The length of the knife ought to be such that the broadest part required for the operation should be about half an inch from the point. This admits of the incision of the cornea being completed without the nose being wounded; and, at the same time, the breadth of the knife increases so gradually that it penetrates with facility, without the premature escape of the aqueous humour.

An extracting knife made upon these principles, with two straight edges, forms at its point an angle of 15°, as is represented in Figure 11. A knife of this form, prolonged towards the handle, constitutes that of Beer, now so generally employed. Figure 12 shows that this knife may be considerably reduced in size, and yet be of sufficient breadth to complete the incision. And it will be found to be of the utmost consequence in practice that it be reduced to the least possible breadth; for upon this the facility and safety of using it very much depend.

The blade of the proper knife, therefore, for this operation should, at its point, form an angle of 15°; it should be from an inch and a quarter to an inch and a half in length; and although the breadth is regulated by the angle formed, no part of it requires to be more than a quarter of an inch broad. Both the back and the cutting edge of the blade should form straight lines, at least to the broadest part; sharp on both edges near the point; the back ground off nearly to a cutting edge; the blade thin, but retaining sufficient firmness not to bend in use; and the cutting edge should be set so as to cut by pushing the blade forwards.

This being the most simple and best form of knife which can be devised on mechanical principles, it may be compared with those recommended for this operation by some of the most celebrated and successful operators, which are delineated in the accompanying plate. By comparing these with that above described, it will be observed that those of La Faye, Wenzel, Ware, and Phipps, though possessing some of the same characters, were more of a lancet shape. Those of Richter, Beranger, Pope, Démours, Arnemann, de Santa Anna, Himly, and Rust, though straight in the back, were convex on their cutting edge, and increased too rapidly in breadth for their easy penetration; while those of Barth, Beer, Rosas, Jaeger, Lawrence, Wardrop, and Tyrrell, are nearly similar to that described above, and delineated in Figure 11. The gradual increase of breadth in these knives, however, is various, as is shown by the angle which the blade forms; that of Barth being 10°, of Beer, 15°, that of Rosas, 18°, while that which I have recommended as the best is 15°.

Knives of various other forms have been invented for the same purpose, which their authors conceived to possess peculiar advantages for lessening the difficulty of the operation. These it would be useless, and therefore it is unnecessary to describe. But one of them, invented and used by Pellier, after several modifications in 1785, having been re-invented by Mr Scott of London in 1843, has been delineated in the plate, Figures 7 and 8. This form of blade will be found to complete the section with greater difficulty than a straight one, in consequence of the convex cutting edge, after transfixing the eye, coming into contact with nearly the whole extent of the part of the cornea to be cut, at once; whereas, the straight knife cuts it gradually.

The double-bladed knife of Jaeger, for using when the operator fails in completing the section with the common knife, has also been figured in the plate, (Fig. 9.) In practice it will be found that the blade intended to fix the eye fails to do so, in consequence of the other blade pushing the eyeball away from that which is fixed, when it is projected forwards to complete the incision.

Having made these remarks on the form of the knife to be used in this operation, I shall now proceed to offer a few observations on the mode of performing the operation.

The most important and difficult part of the operation undoubtedly is, to make the incision of the cornea. When this is successfully completed the difficulty and danger of the operation are over.

The flap or incision of the cornea may be made either upwards, downwards, or diagonally; and this is not material so far as the form of the parts is concerned; for the cornea, pupil, and lens being each circular, a suitable incision may be made at any part of it. But, on account of the facility of execution, the situation of the cicatrix, and the effect of the mobile eyelids upon the flap, a selection is necessary to be made according to the judgment of the operator. I have seen the operation equally successful either way. But, on the whole, probably the incision upwards is to be preferred, because the flap is less apt to be distended by the motions of the eyelid, and the cicatrix, if opaque, interferes less with vision than when the incision is made downwards.

During the performance of this operation no pressure is to be made on the eyeball, and the hand must be prepared to follow the movement of the eyeball.

In passing the knife across the eye to effect the second penetration through the cornea, its motion forwards cannot be too quick and unhesitating, consistently with exactness; while the subsequent movement of the knife for completing the incision cannot be too slow and gradual; and, in effecting this, it is safest and best to divide the last portion of the cornea or bridle by a backsweep of the knive, or by the instrument which I have devised for the purpose, (Fig. 13.)

By attending to these rules, the premature escape of the aqueous humour, and the projection of the iris under the edge of the knife, are prevented.

When, from any untoward circumstance, the incision cannot be completed without the risk of wounding the iris and hyaloid membrane of the vitreous humour, which projects behind it, the knife should be withdrawn, and the small blunt-pointed knife (Fig. 13,) should be employed to enlarge the opening in the cornea to the proper extent. By the cutting part of this knife being confined to a small space, sufficient to act upon the cornea, injury to the iris and eyelids is prevented, which cannot easily be avoided when a knife is used which cuts with the whole extent of its blade.

The proper incision of the cornea being completed, the careful section of the capsule of the lens, without injury to any of the neighbouring parts, forms the next step of the operation. For this purpose, I find the small phleme-shaped knife or curette (Fig. 14.) to be most suitable. Two crucial incisions should be made, and great care is required to preserve the hyaloid capsule of the vitreous humour entire, which forms the only barrier to the escape of this fluid.

The operation being completed, by either pressing out the lens or extracting it by a small hook, (Figs. 6 and 16,) the flap and eyelids are to be carefully adjusted, and the patient confined to bed in a darkened room. When the lens encounters a difficulty in passing through the pupil, it may be necessary to enlarge the pupil by transverse section of the iris at one side of it.

After the operation of extraction and other injuries of the eye, the application of cloths cooled with iced water will be found most efficacious in preventing and subduing inflammation, in conjunction with the other means usually employed.

I must now conclude these remarks, already too long, with a short account of the dissection of an eye from which I had successfully extracted the lens seven years previously. The anterior half of the eye is represented by Fig. 17, as viewed from behind. No injury was done to the eye by the operation, except the incisions of the cornea and anterior part of the capsule of the lens. The patient made a good recovery. A circle of opaque lenticular substance will be seen within the capsule of the lens at its circumference. It appears to me to be a difficult question to answer, whether this is a portion broken off from the margin of the lens at the operation, which has remained there for seven years undissolved; or consists of new lenticular matter, poured out from the parts by which it is formed, as an attempt at the reproduction of the lens—a circumstance alleged by physiologists to take place after its removal in the lower animals, and one of some practical importance.

In a subsequent communication I shall make a short review of the other operations for cataract, and a few remarks on the comparative merits of extraction and couching.

51 *Queen Street, Edinburgh,*
*August* 1845.

*Description of Plate.* II.

Fig. 1. Knife of De La Faye, invented and used by him for the extraction of cataract, 1752. He had the merit of being the first to invent a knife of this form, so as to complete the section of the cornea by one incision. Many others subsequently used a similar knife; among these were Wenzel, Ware, and Phipps, whose knives were more completely lancet-shaped.

Fig. 2. Knife of Richter, somewhat similar to that of Beranger. The same was used by Poré, Demours, Arnemann, de Santa Anna, Himly, Rust, and others.

Fig. 2, *a*. Lancet-shaped knife of Richter, Wenzel, and Ware.

Fig. 3. Knife of Barth, drawn from one used by him, preserved in the collection at Vienna.

Fig 4. Knife of de Santa Anna.

Fig. 5. Knife of Beer of Vienna. Those used by Rosas, Jaeger, Lawrence, Travers, Guthrie, Wardrop, and Tyrrell, are of the same shape.

Fig. 6. Hook needle of Beer, with which he cut open the capsule, then by penetrating the lens, has pulled it out along with the needle.

Fig. 7. Curved knife of Pellier, 1785.

Fig. 8. Do. of Mr Scott, London, 1843.

Fig. 9. Double-bladed knife of Professor Jaeger. One somewhat similar was recommended by Mr Guthrie.

Fig. 10. Circle representing the size and figure of the cornea, *a*, *a*; line representing the incision for the extraction of the cataract, *b*, *f*, *b*; the space from *c*, *c*, to *d*, *d*, the breadth required for the blade of the knife to complete the section by transfixing the cornea.

Fig. 11. Knife of most suitable size and form for the purpose, its point forming an angle of 15°.

Fig. 12. Knife reduced to the smallest size for the same purpose, similar to that of de Santa Anna.

Fig. 13. Small blunt-pointed knife, having its cutting edge confined only to the small space (*a*. *b*) required for completing the section of the cornea, or for enlarging it, without injury either to the iris or eyelids.

Fig. 14. Curette and scoop, for dividing the capsule of the lens, and removing the cataract when it breaks into pieces.

Fig. 15. Knife of Rosas of Vienna, forming an angle of 18°.

Fig. 16. Small hook for pulling out the lens, when it does make its exit by gentle pressure upon the eye.

Fig. 17. Anterior half of eye seven years after the extraction of the lens. See Case, p. 399.

Fig. 18. Lines drawn at different angles, showing the comparative breadth of the knives above described, according to the angle formed at the point.

(*To be continued.*)

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## ART. VIII.—*Two Cases of Disease and Enlargement of the Spleen, in which death took place from the presence of purulent matter in the blood.*

### *Case* 1. *Case of Disease of the Spleen, in which death took place in consequence of the presence of purulent matter in the blood.* By DAVID CRAIGIE, M.D., Fellow of the Royal College of Physicians, Senior Physician to the Royal Infirmary.

MANY instances of disease of the spleen, especially of chronic enlargement, have been recorded by different observers; and all have contributed more or less to illustrate either the great size which this organ may attain, without much disorganization, or the peculiar nature of different forms of disorganization to which the organ is liable. Probably the most common of all the forms of disease to which the spleen is liable, is that of simple enlargement, without perceptible change or structure, or what may be denominated hypertrophy. I say without perceptible change of structure, because I am not prepared to admit that there is not some change of structure, though that may not be visible on simple inspection, or even capable of demonstration with a good glass. What makes me further think that in several of these instances of enlargement there is some change in structure, is, that the substance of the spleen is invariably firmer, or harder, or more resisting than in the healthy state. On the other hand, the frequency with which even considerable enlargements of the spleen subside, and the organ is restored, so far as we can judge, to its natural size, may be regarded as a proof that the structure is not in these cases very much altered, and perhaps is not at all changed.

For information on these points we are indebted to Bartholin, Blaes, Blanckard, Schenke, Morgagni, and Lieutaud; but, above all, to Bree and Grottanelli.

Christopher Hellwig Schmidt, indeed, published in 1816, at Goettingen, an inaugural dissertation or prize essay on the Pathology of the Spleen, which, it must be allowed, like the dissertations published at foreign universities, contains a very good and learned view of the various morbid conditions to which the organ is liable.* Like inaugural dissertations, however, the author writes rather from the observations and facts collected by others than from personal experience; and though the production is undoubtedly one of great merit, it is deficient in this important and essential character, of facts collected from personal observation and experience.

Dr Bree published his cases in the Medico-Chirurgical Transactions; and since his time many isolated communications have appeared in the periodical publications of Great Britain, France, Germany, and Italy.

It is to Stanislaus Grottanelli of Pitigliano, in the Dutchy of Tuscany, that belongs the merit of writing an instructive monograph on the morbid conditions of the spleen; and especially of those which are apt to take place in aguish districts, as the effect either of the aguish miasma without ague, or of the aguish attack once or several times; and though this essay was published in 1821, it is perhaps entitled to the character of being still regarded as the most complete that we possess. Not only has this author recorded accurately a great number of examples of more or less disease of the spleen, but by the introduction of *Mantissae*, in imitation of the older physicians, or clinical discussions and inquiries, he has endeavoured to throw light on all of them, and has exerted himself assiduously to investigate the causes of these diseases, to elucidate their distinctive characters, and to improve and render efficient their treatment. *

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* Christophori Hellwigii Schmidt, Bremani, Commentatio de Pathologia Lienis Observationibus per Anatomen institutis, Indagata, ad illustrandam physiologiam Aenigmatici hujus Visceris. In certamine litterario Civium Academiae Georgiae Augustae Die iv. Junii, 1816, Praemio Regis Munificentia constituto ex Sententia Illustris Ordinis Medicorum Ornata. Goettingæ, 1816. 4to. Pp. 60.

It is remarkable, nevertheless, that amidst all these observations, little, I may say no attention has been given to the mode in which, in certain circumstances, disease, probably enlargement of the organ, proves fatal. Grottanelli and others have recorded many cases of disease of the spleen terminating fatally, and they have given, where they have had opportunity, accounts of the appearances found after death. In most of these cases, it was found that the spleen was more or less enlarged, or more or less indurated, or much softer than usual; sometimes occupied with tubercles; sometimes containing one or two abscesses; sometimes dissolved as it were in purulent matter; in other instances connected by adhesions to all the surrounding organs. I have nowhere, however, found an exact or perfect resemblance to the circumstances of the following case and the appearances which it presented after death. Though not unexpected, indeed, it was in some respects new; and, on this account, I made a correct description of it, expecting at some future period that the chief facts might be confirmed by subsequent observation. For this reason I kept it unpublished from the period at which it took place; and it is published at this time, chiefly because the occurrence of a case in many, if not in all respects similar, to another physician in the same hospital, led me to anticipate similar results, and went far to confirm my conclusions deduced from the first case.

Peter Campbell, aged 30, residing in the neighbourhood of Lanark, by occupation a weaver, was admitted on the 24th of February 1841 into the Royal Infirmary, with symptoms of feebleness, impaired health, and diffuse swelling of the belly. The derangement in health and feebleness, he stated, had been continuing for twelve months past. He mentioned that his ailments first began by an attack of illness, of which the prominent symptoms were those of rheumatism, which continued for six weeks. He was then seized with severe pain in the left side, resembling cramp, which had recurred at intervals up to three weeks ago.

On being asked when he first perceived the swelling in the abdomen of which he now complains, he states, that there was no appearance of this symptom until four months ago, when he first felt hardness and swelling in the left epigastric and hypochondriac regions, but without pain. This swelling has been gradually increasing up to three weeks before his admission, and has been quite stationary since that time to the period of admission.

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* Ad Acutæ et Chronicæ Splenitidis in Humilibus præsertim Italiæ Locis consideratæ, eidemque succedentium morborum Historias Animadversiones. Auctore Stanislao Grottanelli, Philosophiæ, Medicinæ et Chirurgiæ Doctore, Socio I. R. Academiæ Senensis, &c. Florentiæ, 1821. 8vo, pp. 199.

On admission the belly is uniformly swelled, prominent, and distended, especially the whole of the infra-umbilical region. The swelling is soft and elastic, and compressible over the whole space on the right side of the *linea alba*, and also on the left of the infra-umbilical region, below a line drawn transversely across about half an inch below the *umbilicus.*

On the left of the *linea alba*, however, and above the transverse line now specified, it is hard, resisting, and solid. In this part also the sound elicited by percussion is completely dull; but below the transverse line specified it is much clearer, and in the left iliac region it becomes almost tympanitic. On the right side of the *linea alba*, on the other hand, the sound emitted is rather dull, but the swelling is, as already stated, soft and elastic.

On placing the patient in the horizontal position, so as to relax the abdominal muscles, it is easy to feel, nearly at the *linea alba*, but encroaching upon the right side of it, a hard resisting body with a distinct circumscribed edge.

The upper part of this body can be felt as high as the epigastrium, where its edge is hollow or sinuous, and does not cross the *linea alba.* But below that it crosses the *linea alba*, and forms a prominent border extending about an inch on right side of *linea alba.* The lower edge of this body is rather irregular, being prominent below the umbilicus, but receding towards the left hypochondriac region.

There can be no doubt, nevertheless, that it proceeds from under the left hypochondriac region, which emits a dull sound on percussion, corresponding to the fourth rib, and as far up as the left *mammilla.*

It is also manifest to the eye that the left hypochondriac region is considerably more prominent and bulging than the right. The bowels are stated to have been confined at the first appearance of the tumour about nine months ago; but since that they have been more regular. He has never had any vomiting, shiverings, or chills; but he states that he has perspired considerably during the night the whole course of the disease. The pulse is from 92 to 96 in the minute. Respiration is impeded, and becomes laborious when he ascends a stair or acclivity.

He was ordered to have one drachm of the compound jalap powder, with fifteen grains of carbonate of soda, and that it should be repeated next morning.

26th. Eight motions, and thinks there is less weight and distension in the abdomen; feels also that he can breathe more easily, but in other respects the appearance of the tumour is the same. Pulse 84; tongue a little furred. The compound jalap powder and carbonate of soda was again ordered; and the following morning one ounce of the volatile oil of turpentine.

27th. Seven motions, and sense of weight and distension still more abated. He has, however, been perspiring very profusely. One drachm of the compound jalap powder, with fifteen grains of carbonate of soda, was prescribed, and next morning the cathartic draught.

March 4th. Tumour continues much in same state. Two motions yesterday. Diaphoresis less urgent. Same medicine as at last report.

5th. Some distension and swelling of belly last night after eating porridge and sour milk. Eleven motions stated. Tongue a little furred. To have additional milk. Compound jalap powder and carbonate of soda.

8th. Considerable swelling of belly, especially the right side. Bowels reported open. Tongue clean.

℞. *Ioduret. Ferri* gr. xii.; *Aq. Distill.* ℥iij. *M.*
*Capiat unciam unam ter in dies.*

9th. Two motions; felt rather swelled and distended. Solution has been taken three times without any sensible effect. Solution has not the usual appearance of ioduret of iron.

℞. *Ioduret. Ferri* gr. xii.; *Aq. Distill.* ℥iij. *Sol.*
*Capiat unciam unam ter in dies.*

23d. Has been going on with the ioduret since last report. Diaphoresis the same as formerly. Urine rather diminished. Considerable swelling of abdomen, with distinct fluctuation in hypochondriac region. Feet also a little œdematous. Bowels reported to be moved three times daily. Pulse 96.

℞. *Iodinii* ʒss.; *Hydriod. Potass*, ʒij.; *Ungti Resinosi* ℥ij. *M. ft. Ungt. assidue supra abdom. infricendum.*
*Cap. stat. pil. Colocynth. duas et postea Pulv. Jalap. Comp.* ʒi.

25th. Rather profuse diaphoresis; complains much of severe pain, confined to the right temporal and parietal region. The pulse is quick, and the skin hot; and the patient is very thirsty. —*Abrad. capillitium et admoveantur hirudines* x. *temp. dext.*

26th. Leeches bled freely. Tongue a little furred. Pulse 88. Pain in right temporal region abated, but not gone, and he feels general pain round the whole head. The tumour of the abdomen is very much as formerly. The complexion is brownish coloured and flushed; the expression that of anxiety and pain; and the eye is glaring and injected, like a person a little excited by liquor. Two compound colocynth pills were ordered, and to be followed by one drachm of the compound jalap powder.

27th. Three motions, but the pain in head is not abated. It is confined chiefly to the right coronal and temporal regions; pulse 80; the veins of scalp and temporal artery are very much distended; tongue covered with a whitish viscid fur; the complexion and expression are as yesterday.

*Fiat Venesect. ad* ℥xii. *vel* xvj. *prout vires ferunt. Pil. Colocynth. duas.*

*Intermittatur Iodin. Sol.*

28th. Blood drawn to fourteen ounces, but the pain of head scarcely abated; diaphoresis continued; pain is confined to coronal and frontal regions of right side, and is aggravated by coughing; three motions; pulse 88–90; veins of head and temporal artery still very much distended.

*Admov. Vesicat. supra latus capitis dextrum.*

A blister was directed to be applied over the right side of the head. A pill containing two grains of sulphate of quinine was ordered to be taken three times daily; and at the hour of rest six grains of calomel and six grains of aloes were directed to be administered.

29th. Blister rose imperfectly, but pain is very much gone; pulse 84; tongue covered with a grey fur; five motions; occasional delirium, and a good deal of insensibility.

*Con. Pil. Sulph. Quin.*

30th. Complains much of thirst, with complete anorexia; has had no sleep; pulse 104, rather feeble.

*Hab. Mist. Salin. Ammon.* ℥i. *h. sing. pil. Colocynth. Comp. duas. c. m. Haust. Cath.* ℥iv.

April 1st. Died this morning at five o'clock.

*Inspection on the 3d April.*—The spleen was found extending from about the fourth rib downwards to below the umbilicus in the form of a large pink-coloured tumour. Its upper surface was rough, shaggy, and irregular, with numerous firm adhesions, which had connected it to the muscular peritoneum and abdominal muscles. Firm membranous adhesions also connected it to the lower surface of the diaphragm, and also to the left lobe of the liver. The splenic artery was found larger than usual, and below it a vein, evidently the splenic, as large in diameter as the ring finger of an adult, containing broken-down grumous blood, together with some lightish-coloured matter, which on examination proved to be purulent matter and broken lymph.

The spleen, when removed, weighed seven pounds three ounces and a half. Its colour was of a light pink. Its greatest length, measured from the upper to the lower extremity, was about 11½ inches; the greatest circumference at its broadest part was 15 inches; and its transverse breadth, measured straight across, 7½ inches.

A section was made of the tumour, and the cut surface was of a bright red colour, fleshy and firm, very much like liver, entirely homogeneous, except at the upper part, where was a small portion a little firmer and of a darker colour. Upon looking closely into the section, it presented the appearance of many whitish bodies, not definite in shape, and seemingly forming numerous *septa* between the red matter. The substance of the organ was not softened, nor easily lacerable, and it resisted a considerable force made to separate it. The vessels were very much enlarged, but presented nothing unusual in their interior. The section presented at its outer margin a layer about two lines in thickness, of a much brighter red, and rather firmer than the rest of the tumour, but this had evidently been caused by exposure to the air.

A considerable quantity of the same kind of pink wine lee-coloured grumous blood, semifluid and imperfectly coagulated, mixed with whitish-coloured masses of purulent lymph, was found in the inferior cava and in the mesenteric veins.

The liver weighed six pounds three ounces; its structure was not unnatural; its vessels, especially the divisions of the portal vein, contained a large quantity of the same kind of blood, with some fragments of lymph.

The right kidney weighed seven ounces. Its striated structure was healthy, but its surface presented a number of small whitish grey spots, circular in shape and about the size of tares. These were isolated at considerable distances from each other, and they penetrated the kidney about the depth of from one to two lines.

The left kidney weighed six ounces two drachms, was also healthy in its structure, but it presented on its surface a considerable number of the same whitish spots. When these were cut into, they appeared to be homogeneous in structure, of the same consistence, slightly elevated above the rest of the kidney; their number did not exceed eighteen or twenty in each kidney.

*Intestines.*—In the lower part of the ileum the aggregated patches were not visible; but the whole surface of the mucous membrane presented numerous minute bodies not larger than millet seeds; all separated and isolated from each other, and nearly at equal distances, and almost equally diffused throughout the intestine. These bodies seemed to be the isolated follicles hypertrophied.

The colon was very much contracted, but its internal structure was healthy.

*Chest.*—The right pleura was connected to the *pleura costalis* by numerous old shaggy adhesions. The lung itself was healthy, but contained in its middle lobe a small cretaceous mass.

The left pleura was entirely free from adhesions except a small part between the middle and lower lobe. The left lung was natural in structure, except a small portion in the posterior part of the lower lobe, which was slightly hepatized and in the interior granular.

The bronchial tubes of both lungs contained a little viscid mucus.

The blood-vessels of the lungs contained grumous blood with lymph.

The right auricle and ventricle of the heart were filled with blood of the same colour and consistence, and with a considerable quantity of grayish white lymphy-looking masses. The left ventricle also contained a quantity of broken-down grumous blood mixed with whitish-gray grains of lymph. The blood in the left auricle was firmer and less broken down. The inner membrane of the heart was perfectly healthy. The valves were a little thicker than natural; but the apertures were not contracted.

*Brain.*—The convolutions of the right hemisphere were very much flattened and depressed, and in several of the small veins were seen whitish-coloured bodies, like pieces of lymph, which could be moved backwards and forwards by compressing the veins.

The convolutions of the left hemisphere were even more flattened, and lymph was found in a greater number of the veins, and presenting more of a purulent appearance.

Several of the veins at the base of the brain and over the cerebellum were also found containing long whitish cylindrical moulds of lymph; and in the right lateral sinus there was a quantity of brownish-coloured broken down grumous blood, with one or two clots of the same kind, especially where the veins opened into the sinus; but the interior of the sinus itself was not rough, vascular, or thickened.

When the ventricle was opened, the *velum interpositum* was exposed, and the two *venæ Galeni* were found completely filled with lymph, grayish-coloured and firm; and the right one especially was distended, so as to be larger than the left. Several also of the tributary veins of the *venæ Galeni* contained columns of lymph; and several of the small veins of the choroid plexus in like manner contained small columns of whitish lymph.

The brain was thought to communicate more of a viscid feel to the fingers than usual. The white matter of the brain was generally more vascular than usual.

At the anterior extremity of the right *corpus striatum* towards its outer margin, was a portion of the brain sprinkled with reddish spots, slightly softened, and another at the inferior border of the right *corpus striatum*, each about the size of a small bean, rather irregular in shape.

I may here add, that Dr John Reid, at that time prosector, found, on examining the blood of the veins of the abdomen and the sinuses of the brain by the microscope, that it contained globules of purulent matter and lymph.

*Epicrisis*, or Clinical Commentary. — The case now recorded presents several peculiar circumstances deserving particular attention. To the 25th of March matters proceeded as in any ordinary case of spleen disease. But on this day there appears to have taken place an attack of febrile symptoms, with indications of some affection of the brain or its membranes. The man complained of pain in the head, chiefly in the right temporal and parietal regions; and he was a little delirious. To these symptoms were speedily added a peculiar febrile expression of the face, and colour of the complexion; and after careful examination of the whole symptoms, the opinion arose in my mind, that there was some serious affection of the brain or its vessels. It appeared, indeed, that the patient presented many of the symptoms of a man labouring under phlebitis; and though no external cause for this could be detected, yet I inferred that there might be some internal cause, by which this state had been induced.

Meanwhile remedies calculated to act on the general and local disorder were prescribed. But no beneficial result ensued. The symptoms proceeded, and became more urgent; and I was confirmed in the opinion first formed, that the disorder was seated in the brain, probably in its vessels; and that it would proceed to the fatal termination.

On the 29th the pain of the head seemed to be gone; that is, it was not now complained of. But the state of the patient was not improved. The weakness was increased; sensibility and consciousness were impaired; and it was manifest that death was approaching with rapid steps. The breathing was sometimes very rapid; then it became slow and languid; while profuse diaphoresis from the head, neck, and chest continued. The mind of the patient wandered much; and at length increasing insensibility and unconsciousness terminated in death.

Inspection of the body, and especially of the vessels of the head and chest, revealed the cause of all this violent disturbance of the system. It then appeared that all the large veins of both these cavities had been the seat of some peculiar derangement, taking place either in their coats, or in the blood flowing through them. All of these were filled with clots and masses of grumous blood; and most of these clots contained lymph or purulent matter.

These were certainly most distinct and conspicuous in the mesenteric veins; in the sinuses and other venous canals of the brain; and in the heart and its attached veins.

It must at the same time be observed that the inner coat of the veins was not perceptibly roughened, or their coats thickened, as is the case in instances of actual *phlebitis*, or inflammation of the veins. And this may be regarded as in a great measure evidence, that the disturbance which led to the fatal termination, did not consist in simple inflammation of the venous canals. Another circumstance which may be regarded as confirming the same inference, is, that it is almost impossible to suppose, that so many veins, as were found after death, filled with clots of grumous blood and clots containing purulent matter and lymph, could have been either simultaneously or successively inflamed. I therefore think that it is a more probable and rational inference, that by some means or other, purulent matter and lymph had been mixed with the blood, and circulating with it, had given rise to the peculiar febrile and inflammatory symptoms during life, and death in the manner in which it had taken place.

It comes next to be a subject of inquiry how this lymph and purulent matter were formed, and whence they were derived.

If we adopt the inference already stated, that there were no unequivocal indications of inflammation in the venous canals, either of the head, the abdomen, or the chest, then it must follow that this lymph and purulent matter were formed, not within the veins, but without them, or at most at their extremities, or within the substance of some of the organs. The only fact in the whole case which renders this inference in any way or degree doubtful, is the state of the mesenteric veins and of the inferior *cava*; and it is barely possible, that some inflammatory action had taken place in the tributary or constituent veins of the mesenteric trunks; and that the purulent matter and lymph thus formed had been conveyed into their interior with the blood, and thence into the *vena cava*, heart, and vessels of the brain.

This opinion has in its favour mere simple possibility; and of the verisimilitude of correctness of it others must judge.

Another opinion occurred to me, however, as more probable, and which various circumstances in the case induced me to regard as the most correct. Considering that the spleen had been for some time, that is for several weeks, in a state of chronic inflammation, and taking into account the large vessels with which this organ is connected to other organs, it appeared to me that this inflammatory process, which had been continuing so long without abating, subsiding, or being subdued, was at length beginning to give rise to the formation of lymph and purulent matter, and that these substances, as they were formed, were immediately taken into the veins, and thus circulating with the blood, gave rise to the peculiar assemblage of symptoms, which the patient presented during the few days preceding his death.

And here I know it will be at once objected, that if lymph and purulent matter were thus formed, why were they not deposited, as in other cases, in the shape of an abscess in the spleen, the organ which was the seat of the process; and conversely, if they are taken up or imbibed by the veins in this case, why are they not, in other examples of inflammation and suppuration, also imbibed by the veins and circulated through these canals?

To this objection the answer is simple, and it appears to me conclusive.

The spleen is an organ quite peculiar in its structure, and especially in its connection with blood-vessels. It is, if not altogether, at least very much of an erectile organ. Its vessels also receive a much larger supply of blood than its size and structure seem to require; and, while part of this blood goes to the stomach, it seems probable, if not certain, that at certain periods the spleen contains more blood than at others, and that it is the seat of temporary congestions, or periods of vascular turgescence and erection. On the other hand, it is provided with large and numerous veins. It contains a peculiar parenchyma, or red fleshy sort of substance; but it contains also numerous veins, anastomosing and mutually communicating by open mouths. From this anatomical arrangement, it results that all matters secreted are promptly and readily received or imbibed by its venous canals, and thence conveyed into the venous system of the abdomen, and that of the body at large.

We know, further, that suppuration is an occurrence of great, I had almost said, in the exaggerated language of some of the French pathologists, of infinite rarity; that is, it is very unusual. While other organs proceed very often to suppuration, the spleen, when inflamed, very seldom does so. The reason appears to be, not that purulent matter is not formed, but that, when formed, it is immediately or speedily imbibed by the veins, and then circulated with the blood. In this state it may either be carried out of the system by secretion and excretion, as is known often to happen, or it may, if too great in quantity or too speedily formed for the excreting vessels to accomplish this, alter the physical character of the blood, and thus prove a cause of serious disorder, and even of death. This, I think, was what took place in the case now recorded. The purulent matter and lymph were formed in so great quantity and so suddenly, that the excreting organs were unable to remove them from the system. They remained in the blood, and circulating with it, first gave rise to the symptoms of febrile and inflammatory disorder observed on the 25th of March, and afterwards in no long time to fatal coagulation, and stoppage of the motion of the blood.

We must confess that we know absolutely nothing of the circumstances which are most likely to prevent this absorption of lymph and purulent matter by the veins. We know, in short, nothing of the circumstances which might determine the formation of a cyst of firm lymph within the spleen, by which alone this result could be prevented. It is, as I have said, a rare occurrence, but not an impossible one; but though it takes place, the result might have been different as to the mode of death, but not as to the actual occurrence of the event.

One fact is undeniable. The lymph and purulent matter were found in the mesenteric veins and venous canals, the veins of the chest, and the sinuses of the brain. If these did not come from the spleen, it is impossible to see whence they did come. It appears, in short, to have been the only organ from which these articles could have proceeded.

When I had once taken the view now given of this case, the whole appeared to me simple and intelligible. It was, however, only one case, and I thought it requisite to look into those authorities with which I was most familiar, to see if there were any cases which bore any resemblance either in symptoms or morbid appearances. Some of the cases of Grottanelli came near it, but none were altogether similar. Then an insurmountable difficulty in tracing pathological similitudes was found in the imperfection of the dissections. In none was the state of the venous canals, or, indeed, any of the vessels noticed. In short, if I am not greatly mistaken, this was the first case in which the condition of the veins after death and the state of the blood had been examined.

So natural, however, seemed my hypothesis, at least to myself, that the more I thought of it, the more confident did I become of its truth.

All sorts of objections did I imagine against it; but still I found the main points of the speculation strong and impregnable. This confidence was perhaps unreasonable and rash; but I found that when the view had once gotten possession of my mind, it seemed like a strong prejudice incapable of being eradicated.

The only mode of counteracting this feeling, and, at the same time, of ascertaining—the moderns call it testing—the truth of the hypothesis, was to keep a strict look out for similar cases; and I watched and waited for several months, nay, I believe, a much longer time, before any case at all like that of Campbell presented itself. At length, about three years and a half after, a patient named John Menteith, from Livingston in West Lothian, by occupation a slater, aged 28, with a splenic tumour not quite so large, but in many respects, as to history and progress, quite similar, applied for advice and assistance on the 18th November 1844. He was admitted and put under treatment; and, after the application of leeches two or three times, the use of purgatives, and a course of the iodide potassium, he declared himself so much better that he was resolved to go home. I examined him; and found the tumour still there, but certainly less prominent, and, according to the man's own account, less weighty. His wishes, therefore, I could not oppose; and he left the house, promising to return, if the complaint should get worse, as he expressed it.

Some time elapsed; and I was incapable of divesting my mind of the idea, that this man must either die at home, with symptoms similar to those of Campbell, or that he must return to the Infirmary and pass over the same course. At length, after nearly three months, he appeared in the waiting room on the 27th of February 1845, and told me he wished to be again admitted. I would have taken him under my own care into one of my own wards; but I found he had, from the clergyman of Livingston, a note addressed to my friend Dr Christison; and I accordingly directed that he should be sent to the clinical ward. There I observed the progress of the man for some time. At length, about the third week after admission, he was attacked, on the 13th of March, with a set of symptoms so similar to those which preceded the death of Campbell, that I was well assured, that the internal pathological state must be the same, and that it would have the same termination. Death took place, indeed, on the 15th of March 1845, the third day of the attack.

In order to establish the correctness of my reasonings in Campbell's case, it was of the utmost importance to obtain an inspection in this one. The inspection accordingly took place on the 19th March, and I had no hesitation, from my knowledge of the two cases, in predicting that the same appearances, in all essential points, would be found. The result of the examination proved that this prediction was well founded. The venous canals of the chest, abdomen, and brain contained quite similar clots of blood, and the same purulent and lymphy deposits.

The details of this case, however, are now published by Dr Bennett, who conducted the inspection; and readers will have an opportunity of comparing the appearances recognised in these two cases, and of perceiving how similar they are in all essential circumstances. They will also, I think, understand the peculiar mode in which this disease proves fatal.

Whatever opinion may be entertained on the exact source of the lymph and purulent matter, it seems impossible to resist the conclusion, that in this form of disease of the spleen, they are secreted, and being then mixed with the blood, they cause much disorder in the sanguiferous system, and finally destroy the patient.

### Case 2.—*Case of Hypertrophy of the Spleen and Liver, in which death took place from suppuration of the Blood.* By John Hughes Bennett, M.D., F. R.S. E., Lecturer on the Practice of Physic, and on Clinical Medicine, Pathologist to the Royal Infirmary, &c.

The very remarkable case about to be related derives unusual interest from its similitude in almost every respect to the one just recorded by Dr Craigie. Although the most evident lesion during life was enlargement of the spleen, I agree with him in thinking that the immediate cause of death was owing to the presence of purulent matter in the blood, notwithstanding the absence of any recent inflammation, or collection of pus in the tissues.

Numerous authors have asserted [*] that they have found purulent matter in the blood, independent of any local inflammation, or abscess from which it could have been derived. Hitherto all such statements have been very vague, because no measures were taken to ascertain whether this purulent-looking matter was really pus. We frequently meet with animal fluids, which, to the naked eye, resemble pus, although, when more minutely examined, they are found deficient in the peculiar cells that characterize that morbid product. Gulliver more especially has pointed out that the colourless coagula which form in the heart and large vessels break down mechanically or by maceration into a pulpy mass or fluid. The purulent collections in the heart and blood-vessels described by Goodsir and Andral are considered by him to be fibrin softened in this manner. Again, we know that the blood in a state of health contains a number of colourless corpuscles, which closely resemble those of pus. Hence has latterly arisen the opinion, that the isolated pus corpuscles described by some authors were only the normal structures of the blood, and that, where after death large intra-vascular collections of purulent-looking matter were discovered, they were caused by softened colourless coagula.

In the present state of our knowledge, then, as regards this subject, the following case seems to me particularly valuable, as it will serve to demonstrate the existence of true pus, formed universally within the vascular system, independent of any local purulent collection from which it could be derived. The individual entered the clinical ward of the Infirmary under Dr Christison, to whom I am indebted for the history of the case. The *post mortem* examination, and microscopic investigation were conducted with the greatest care by myself, and my assistant Mr Morris.

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[*] Bichat, Ribes, Gendrin, Andral, Bouillaud, Carswell, &c. &c.

John Menteith, aged 28, a slater, married, admitted into the clinical ward of the Royal Infirmary, February 27, 1845. He is of dark complexion, usually healthy and temperate; states that twenty months ago he was affected with great listlessness on exertion, which has continued to this time. In June last he noticed a tumour in the left side of the abdomen, which has gradually increased in size till four months since, when it became stationary.

It was never painful till last week, after the application of three blisters to it; since then several other small tumours have appeared in his neck, axillæ, and groins, at first attended with a sharp pain, which has now, however, disappeared from all of them. Before he noticed the tumour he had frequently vomiting in the morning, The bowels are usually constipated, appetite good, is not subject to indigestion, has had no vomiting since he noticed the tumour. Has used chiefly purgative medicines, especially croton oil, has employed friction with a liniment, and had the tumour blistered.

At present there appears a large tumour, extending from the ribs to the groin, and from the spinal column to the umbilicus, lying on the left side. It is painful on pressure near its upper part only. Percussion is dull over the tumour; pulse 90; states that for three months past he has not lost in strength. There is slight œdema. To have two pills of iodide of iron morning and evening.

*March* 1. Urine of yesterday somewhat turbid when just passed, natural in colour, acid to litmus; sp. gr. 1013. Sediment presents cubic crystals under the microscope, disappears almost entirely on the addition of *aqua potassæ*, but is unaffected by nitric acid. The filtered urine is not affected by *aqua potassæ*, and yields only a slight white haze when boiled.

*March* 3. Legs œdematous, ordered to be bandaged with flannel bandages.

*March* 9. Œdema of legs increased.

℞ *Potassæ Carbonatis*, ʒj.; *Spiritus Ætheris Nitrici*, ʒiv.; *Aquæ Menthæ*, ʒiij.; *Aquae fontis*, ʒij. *Sumat unciam ter in dies.*

*March* 10. Tormina and diarrhœa increased; urine not increased.

*Habt. Haustus ex Olei Ricini,* ℥ss. *statim ; et exactis quatuor horis, Opii* gr. ii.

*March* 12. To have steak diet.

*March* 13. Attacked this morning with heat of skin; thirst; pulse, 110, full, very compressible. Had some diarrhœa yesterday; none this morning since an opium pill. Urine, 100 ounces.

*Omittantur medicamenta. Sumat statim Pulveris Ipecacuanhæ et Opii* gr. x., *et repetatur singulis semihoris ad tertiam vicem.*

*March* 14. No sweating from the powders; diarrhœa still rather troublesome; pulse, 100, softer; tongue dry and brown; febrile expression of countenance resembling that of typhus.

℞ *Aquæ Acetatis Ammoniæ,* ℥vi.; *Solutionis Morphiæ,* ʒi.; *Aquæ fontis,* ℥iij.; *Syrupi,* ℥j. *Sumat unciam quartâ quâque horâ.*

*Habt. Decoctum Hordei pro potu.*

*March* 15. Died suddenly in the morning.

*Sectio Cadaveris. March* 19*th,* (*four days after death.*)— Externally the body presented a considerable prominence of the ensiform cartilage and false ribs on both sides. The abdomen was contracted; considerable dulness on percussion on left side, which had previously been marked out by a line formed with nitrate of silver.

No ascites nor œdema of the limbs.

*Blood.* — The blood throughout the body much changed. In the right cavities of the heart, pulmonary artery, *venæ cavæ*, *vena azygos*, external and internal iliac veins, and many of the smaller veins leading into them, it was firmly coagulated, and formed a mould of their size and form internally. In the cavities of the heart and *vena cava* the blood when removed was seen to have separated into a red or inferior, and a yellow or superior portion. The red portion was of a brick-red colour; it did not present the dark purple smooth and glossy appearance of a healthy coagulum, but was dull and somewhat granular or section, and when squeezed readily broke down into a grumous pulp. The yellow portion was of a light yellow colour, opaque and dull, in no way resembling the gelatinous appearance of a healthy decolorized clot. When squeezed out of the veins as was sometimes accidentally done where they were divided, it resembled thick creamy pus. In some portions of the veins the clot was wholly formed of red coagulum. In others it was divided into red and yellow. In a few places the yellow formed only a streak or superficial layer upon the red, or covered the latter with spots of various sizes. Whether this coagulum existed in all the veins could only have been ascertained by a complete dissection of the body. It was seen, however, that the femoral veins, after passing under Poupart's ligament, were empty and perfectly healthy as far down as the Sartorius muscle.

The external and internal iliac veins, as well as the pelvic veins were full and distended. The azygos, both axillary and jugular, veins, were full, also the longitudinal, the lateral, and other sinuses at the base of the cranium and veins ramifying on the surface of the brain.

In this last situation some of the veins appeared as if full of pus, whilst others were gorged with a dark coagulum. In the aorta and external arteries were a few small clots resembling those found in the veins. These vessels, however, were comparatively empty. The basilar artery at the base of the brain was distended with a yellow clot.

*Vessels.*—The arteries and veins themselves were perfectly healthy. Although carefully looked for, in no place could thickening or increased vascularity be observed. Nowhere was the clot adherent to the vessels, but, on the contrary, readily slipt out when an accidental puncture was made in them.

*Head.*—On removing the *dura mater*, the veins which empty themselves into the longitudinal sinus were considerably engorged, especially posteriorly. Some were filled with the red and others with the yellow clot previously described. Others again were half-filled with red and half with yellow coagulum, the passage of the one into the other being clearly perceived. Both hemispheres with the longitudinal sinus and *falx in situ* were removed by a section across the brain, as low down as the division of the cranium would permit. The brain was then discovered to be very soft uniformly,—a circumstance accounted for by the time which had elapsed since death.

The part removed was put aside in order to be preserved and hardened in spirit. The lateral ventricles were found healthy, contained no serum, and the choroid plexus was perfectly normal. At the base of the brain the basilar artery was seen distended with the yellow coagulum, as were also a few of the arteries, but to a very slight extent.

The substance of the brain itself was throughout healthy. All the sinuses at the base of the cranium gorged with the red coagulum.

*Chest.*—A few chronic adhesions united the pleuræ on both sides, which were easily torn through.

Both *lungs* were slightly engorged posteriorly and inferiorly. The anterior margin of the left lung emphysematous, but to no great extent. On section the yellow coagulum of the blood was observed to occupy all the ramifications of the pulmonary artery. In some places it was so consistent as to be drawn out, exhibiting an arborescent form; in others it was more soft, and exuded from the cut surface like thick pus.

*Heart* somewhat enlarged; weighed, when freed from coagulum, eleven and a-half ounces. Its texture was healthy; the valves normal. The right auricle much distended, and gorged with a firm coagulum, the upper third of which was found composed of the yellow, and the two inferior thirds of the red clot formerly described. The right ventricle and pulmonary artery were similarly distended; portions of the clot closely embraced the *columnæ carneæ*, but were in no place adherent. The coronary arteries and veins were normal.

*Abdomen.*—On the inferior surface of the diaphragm there existed a firm almost cartilaginous deposit about a line in thickness, of a white colour, oval form, two inches long, by one and a-half broad, with irregular margins, which were composed of several rounded tubercular bodies, the size of a small pea, and of a similar structure.

The *liver* enormously enlarged from simple hypertrophy. Its structure throughout healthy. Gall-bladder enlarged and distended, with a clear pale yellow bile. The whole weighed ten pounds twelve ounces.

The *spleen* also enormously enlarged from simple hypertrophy. It was of a spindle shape, largest in the centre, tapering towards the extremities. It weighed seven pounds twelve ounces. It measured in length fourteen inches; in breadth, at its widest part, seven inches; and in thickness, four and a-half inches. Towards its anterior surface was a yellow firm exudation, about an inch deep, and three inches long. The peritoneum, also covering a portion of its anterior surface, was thickened, opaque, and dense over a portion about the size of the hand.

Both *kidneys* healthy.

The *stomach* and *intestines* healthy throughout. About four inches from the anus the superior hæmorrhoidal veins were distended on both sides external to the rectum. They formed two chains of tumours about three inches long, consisting of, on the one side, three swellings as large as a walnut; on the other, of one swelling somewhat larger. They were filled with the red coagulum, broken down into a grumous mass.

The *lymphatic glands* were every where much enlarged. In the groin they formed a large cluster, some being nearly the size of a small hen's-egg, and several being that of a walnut. The axillary glands were similarly affected. The bronchial glands were not only enlarged, but of a dark purple colour, and in some places black from pigmentary deposit. The mesenteric glands were of a whitish colour, some as large as an almond nut. A cluster of these surrounded and pressed upon the *ductus communis choledochus* The lumbar glands were of a greenish yellow colour, also enlarged, forming a chain on each side, and in front of abdominal aorta, more especially at its bifurcation into the ilia No collection of pus could be found in any of the tissues.

Microscopic Examination.—The yellow coagulum of th blood was composed of coagulated fibrin in filaments, intermixed with numerous pus corpuscles, which could be readily squeezed out from it when pressed between glasses. Where the yellow coagulum was unusually soft, the corpuscles were more numerous and the fibrin was broken down into a diffluent mass, partly molecular and granular, partly composed of the debris of the filaments broken into pieces of various lengths. The corpuscles varied in size from the $\frac{1}{80}$th to the $\frac{1}{120}$th of a mill. in diameter; they were round, their cell-wall granular, and presented all the appearance of pus corpuscles. That they really were such was proved by the action of water and of acetic acid, the former of which caused them to swell and lose their granular appearance, whilst the latter dissolved the cell-wall and caused a distinct nucleus to appear.

This nucleus was generally composed of one large granule about the $\frac{1}{300}$th of a mill. in diameter; but here and there two or three smaller granules could be observed, as is seen in corpuscles of laudable purulent matter.

The red portion of the coagulum contained a large number of these pus corpuscles, mixed, however, with a multitude of normal yellow corpuscles.

The pus corpuscles above described were found in the blood throughout the system. They were seen in the veins and arteries ramifying on the brain, in the coronary veins, hæmorrhoidal tumours, and wherever the blood was examined. On stripping off a portion of the *pia mater*, and examining the capillary vessels of that membrane, all that were not too minute to contain them were found crowded with the same corpuscles. This fact was confirmed by Dr A. Thomson, to whom I sent a portion of the brain for that purpose.

The cartilaginous deposit on the inferior surface of the diaphragm was composed of dense fibrous tissue, in which numerous granules and molecules were observed.

The exudation in the spleen was composed of amorphous fibrin mixed with numerous molecules, granular and imperfect cells. These were intermingled with bundles of filamentous tissue.

The enlarged lumbar glands, on being pressed, exuded a fluid that was crowded with corpuscles; some resembling those of pus already alluded to; others oval, containing a distinct nucleus. Acetic acid produced the same changes in these as in the pus corpuscles found in the blood.

The ultimate texture of the muscles, brain, nerves, &c. were carefully examined and found normal.

*Remarks.*—The points connected with this case that require discussion are, 1*st*, the connection between the symptoms and morbid appearances; 2*d*, were the corpuscles contained in the blood really those of pus? and, 3*d*, if so, how were they produced?

1. The connection between the symptoms and morbid appearances does not appear very evident. The enormous size which the liver and spleen had attained caused no great inconvenience. There was only slight œdema of the legs, without ascites. The most important symptom in the case was the occurrence of fever on the 13th, which continued until his death. This was sudden and unexpected.

Reasoning from these facts, it is clear we cannot ascribe death to the lesion of the liver or spleen, or to the structural alterations found in the tissues. On the other hand, there are equal difficulties in ascribing it to the fever, for in this case it did not exist to any great extent, and was unattended by prostration of strength. Again, in cases of phlebitis and purulent absorption, when we know pus has entered into the circulation, the symptoms in some respects are different. In phlebitis there are a greater or less number of local symptoms which here were absent. In purulent absorption, in addition to local symptoms, we have a peculiar depressing form of fever, local pains, and often yellow skin.

In Dr Craigie's case, however, the fever was more marked and longer continued. Cephalagia and delirium were present. Blood was extracted from the arm, but unfortunately its character is not stated, nor was it examined microscopically. Whether pus existed in the blood at that time, therefore, cannot be ascertained with certainty, but it is at least highly probable. When both cases are taken into consideration, I think there can be little doubt that pus in the blood was the cause of death, and that it produced the febrile symptoms.

It is important to remember that there was no phlebitis, abscess, or purulent collection to which the appearances within the vessels could be ascribed. In all cases of phlebitis there are changes in the vessels themselves, and the clot is more or less adherent to the vascular walls. Nothing of the kind could be detected in either of the two cases related, although in both particular attention was paid to this point.

How far the hypertrophy of the liver and spleen may be connected with the coagulation of the blood, and the formation of pus, it is difficult to say. The remarkable similarity between the two cases would lead us to conjecture that in some way they stand in the relation of cause and effect. Whether the hypertrophy of these organs exercises a peculiar influence on the blood, or whether the change in that fluid be caused in connection with ch diseases in general, as has been lately pointed out by M. F chut,* farther observations alone can determine.

2. The second point of inquiry is, were the corpuscles obse ed in the blood really those of pus? The only bodies with whi they can be confounded are the colourless corpuscles of the bloo itself, the corpuscles described by Gulliver as existing in softene fibrin, and those found in lymph.

With regard to the colourless corpuscles of the blood, we know of no instance where they existed in the amount, or ever presented the appearance described.

As regards softened fibrin Gulliver observes, "Besides its proneness to putrefaction, softened fibrine differs in some other chemical properties from pus; and the characteristic globules of the latter are either wanting in the former, or not in sufficient quantity to render the matter identical with pus. The mass of the softened fibrine, in short, is made up of a very minutely granular substance, frequently with some very irregular flaky particles,—the globules which it often, and indeed generally contains, forming but a small proportion to the other materials; whereas the globules of pus constitute the bulk of the particles visible by the microscope."† This description in no way applies to the present case; the bulk of the matter being undoubtedly pressed by pus corpuscles. In other cases, however, it would appear that Gulliver has seen similar bodies very numerous in clots. Thus, in a clot from the portal vein of a woman, and in another from the heart of a man aged 31, who died of sphacelus and suppuration, they were in vast numbers.‡ On the addition of an acid, their nuclei were shown naked, mostly rather irregular in shape, generally nearly round, and not uncommonly oblong, as if extended by growth. He adds, these "corpuscles may be sometimes found together in great abundance in one part of a clot, when the most diligent search is unable to detect them in another part not many lines removed; and many clots may be examined without finding any of the corpuscles."§ From this description it is not very clear whether the latter corpuscles are identical with those seen in the case under discussion; but there occurring partially only here and there is a circumstance very different from the universal presence of these bodies throughout the capillaries, as seen by myself and Dr A. Thomson. To determine whether softened coagula assume the character and appearances observed in the clots of this case, I repeated the experiments of Mr Gulliver, and macerated portions of colourless clots found in the heart in inverted intestines and pieces of oil silk. I found his descriptions to be exact, but satisfied myself that the corpuscles of the artificially softened clot were widely different from those observed in the vessels of Monteith. This was strikingly apparent on adding acetic acid. Without figures it is not possible to demonstrate this perfectly, and circumstances have prevented my publishing these in the present Number of the Journal. They will be given, however, on some future occasion.

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* See Memoire sur la Coagulation du sang Veineux dans les Cachexies et dans les Maladies Chroniques, Nos. 16 et 17 Gazette Medicale de Paris, 1845. Translated in Lond. Med. Gazette, Nos. 916–918, 1845.

† Gerber's Anat. p. 29.

‡ Idem. p. 33.

§ Idem. p. 34.

With respect to the corpuscles observed in plastic lymph (plastic corpuscles) they are easily distinguished by the phenomena observed on adding acids. They never present the peculiar nucleus of pus globules, although they otherwise much resemble those bodies. It is on this account that they have lately been denominated by Lebert "*pyoid.*"

When, then, we take into consideration the existence of these corpuscles throughout the vascular system, their general size and appearance, and, above all, the changes they underwent on adding water and acetic acid, there can be little doubt that they were true pus globules.

3. The next question is, how were these corpuscles formed? Pus has long been considered as one if not the most characteristic proofs of preceding acute inflammation. But in the case before us what part was recently inflamed? There was none. Piorry and others have spoken of an inflammation of the blood, a true hematitis; and certainly if we can imagine such a lesion, the present must be an instance of it. But it would require no laboured argument to show, that such a view is entirely opposed to all we know of the phenomena of inflammation. Without entering into this discussion, however, I shall assume it to have been satisfactorily demonstrated that we can form no idea of this process, without the occurrence of exudation from the blood-vessels, and that, consequently, the expression inflammation of the blood is an error in terms.* A moment's reflection will make it evident that all our ideas of, and facts connected with inflammation are associated with some local change in the economy. The constitutional disturbance connected with it we invariably ascribe to phlegmasia or fever, which pathologists hitherto have always separated. Unless, therefore, it could be shown that inflammation and fever were like processes, we must conclude that the alteration of the blood in this case was independent of inflammation properly so called.

But can we explain the production of pus independent of inflammation? We reply in the affirmative. The corpuscles of pus arise in a blastema formed of *liquor sanguinis.* This fluid, when exuded through the blood-vessels, does not thereby in itself undergo any change. If any circumstances, therefore, should arise by means of which it could be separated from the red corpuscles within the vessels, there is no reason why these pus cells should not be formed in it. Facts point out that this coagulation happens not unfrequently. Clots have been diagnosed in the heart and large vessels during life; cases are recorded where on puncturing veins in order to bleed, clots forming a mould of the vessel have been extracted.* M. Bouchut has lately pointed out the frequent coagulation of the blood in cachexias and chronic diseases, and we know that aneurismal dilatations and partial enlargements of arteries favour the formation of coagula and the stagnation of the blood. That, under such circumstances, pus corpuscles are occasionally formed, I have had numerous opportunities of satisfying myself.

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* See the writer's Treatise on Inflammation, p. 52.

In cases of phlebitis, where the vessel is obstructed by lymph, the clot presents different appearances under different circumstances. It is sometimes granular, at others contains molecular fibres resembling those in colourless coagula, and occasionally perfect pus corpuscles may be seen in it. I found these in the centre of a clot in the femoral veins of a man who died after amputation under Mr Syme. They were present also in the coagulum of the axillary vein in an individual who died under Dr Alison, with œdema of the right superior extremity. I have also found them in the centre of organised clots attached to the endocardium. In all these cases the peculiar granular nucleus was rendered apparent by the addition of acetic acid. Positive facts, therefore, indicate that pus can form in *liquor sanguinis* within the vessels independent of inflammation. In so doing it is produced according to the more general laws which govern the origin, growth, and decay of all cellular formations.

In the cases to which I have just alluded, the pus was prevented entering into the torrent of the circulation, either by unchanged portions of coagulable lymph, or by organised membranes which surrounded the clot. But in the case detailed, the transformation had taken place throughout the system, and the whole mass of blood was affected. How is this to be explained? Of late years a doctrine has been introduced by the chemical school, which attributes fever to a process in animals similar to that of fermentation. By this process, demoninated *zymosis*, (from ξυμοω, to ferment,) an endeavour has been made to explain how, from the peculiar poison of small-pox, cow-pox, glanders, &c., similar diseases may be propagated. In short, a zymotic action is set up in the blood, whereby, from the contact of a small quantity of matter, the whole mass is affected. Many facts in pathology are in harmony with this theory, and more especially all we know of the formation of pus in the blood, or its introduction by absorption or mechanical means. The experiments of Magendie, who injected pus into the veins, the phenomena of purulent absorptions after wounds and injuries, all indicate a general fever, dependent on the admixture of pus with the blood. Conclusive evidence is of course wanting to establish the theory alluded to, but the case under consideration appears to me capable of furnishing an important fact, which at some future period may serve to throw light upon the subject.

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* Edin. Med. and Surg. Journ. vol. lii.

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## ART. IX.—*On the Period of Puberty in Hindu Women.* By JOHN ROBERTON, Esq. Surgeon, Manchester.

THROUGH the interest of a friend at Bangalore, to whom I am under especial obligation, the Rev. Eden Crisp, I have had forwarded to me the following tabular document, the facts contained in which, added to those supplied by Professors Goodeve and Webb, to be found in the last Number of this Journal, constitute a tolerably large body of evidence, both as to the period of puberty, and the age at the birth of a first child; the instances, in reference to the period of puberty, now being 310; and those with regard to the age of the mother at a first parturition, 163.

The table in question, Mr Crisp informs me, was drawn up by "an apothecary" in the Honourable East India Company's service; and he adds, "I have no doubt he has made every effort to secure correct information; and this is not easy with regard to the lower classes, who are not particular and careful, as to dates, to the same extent as the higher castes."

Without further preface I give the table, which very intelligibly tells its own tale. It may be proper, in the way of explanation only, to add, that Bangalore, in the neighbourhood of which the facts were collected, is a delightfully situated, salubrious city, latitude, 12° north, in the Mysore country, presidency of Madras; being 10° further south than Calcutta, whence were obtained my former returns.

"Register of Women, showing their present Age, the age when their Menses first appeared, and the age when they gave birth to their first child. Taken from among the inhabitants, June 1845.

| Caste. | Running No. | Age at present. | Age when the Menses first appeared. | Age when the first child was born. | Time when the marriage was consummated after puberty. | Remarks. |
|---|---|---|---|---|---|---|
| BRAMINS. | 1 | 12 | 10 | ... | Not yet. | Husb. being absent from home. |
| | 2 | 14 | 12 | 14 | Under 16 days. | |
| | 3 | 14 | 11 | ... | Do. | No conception yet. |
| | 4 | 15 | 12 | 13 | Do. | |
| | 5 | 15 | 13 | 15 | Do. | |
| | 6 | 16 | 13 | 14 | Do. | |
| | 7 | 16 | 13 | 15 | Do. | |
| | 8 | 17 | 13 | 15 | Do. | |
| | 9 | 17 | 15 | ... | Do. | Now 8 months advanced in preg. |
| | 10 | 18 | 13 | 16 | Do. | |
| | 11 | 18 | 13 | 15 | One year after. | Husb. being absent from home. |
| | 12 | 18 | 14 | 15 | Under 16 days. | |
| | 13 | 19 | 14 | 17 | Do. | |
| | 14 | 19 | 13 | 15 | Do. | |
| | 15 | 19 | 16 | 19 | Do. | |
| | 16 | 20 | 15 | 16 | Do. | |
| | 17 | 20 | 13 | 15 | Do. | |
| | 18 | 21 | 14 | 19 | 8 months after. | For want of means to meet the expenses attend. the ceremony. |
| | 19 | 21 | 14 | 15 | Under 16 days. | |
| | 20 | 21 | 13 | 16 | 45 days after. | For want of a fortunate day the marriage was not consummated sooner. |
| | 21 | 22 | 15 | 17 | Under 16 days. | |
| | 22 | 22 | 16 | 18 | Do. | |
| | 23 | 22 | 12 | 16 | One year after. | Sickness on the part of the girl caused the delay. |
| | 24 | 22 | 14 | 16 | 7 months after. | For want of a prosperous day to perform the ceremony. |
| | 25 | 22 | 16 | 17 | Under 16 days. | |
| | 26 | 23 | 16 | 19 | 8 months after. | Husb. being absent from home. |
| | 27 | 23 | 16 | 19 | Under 16 days. | |
| | 28 | 24 | 14 | 17 | Do. | |
| | 29 | 24 | 16 | 17 | Do. | |
| | 30 | 25 | 15 | 17 | Do. | |
| | 31 | 25 | 15 | 17 | Do. | |
| | 32 | 25 | 15 | 17 | One year after. | Husband having been sick. |
| | 33 | 26 | 12 | 14 | Under 16 days. | |
| | 34 | 27 | 11 | 14 | One year after. | For want of means. |
| | 35 | 27 | 12 | 13 | Under 16 days. | |
| | 36 | 29 | 15 | 16 | Do. | |
| | 37 | 29 | 17 | 18 | Do. | |
| | 38 | 29 | 14 | 20 | Do. | |
| | 39 | 30 | 13 | 14 | One month after. | Delayed for want of a fortunate day. |
| | 40 | 30 | 16 | 20 | Under 16 days. | |
| LINGAYETS. | 41 | 18 | 13 | 15 | 3 months after. | These people don't marry their children so early as Bramins do, and in most cases marriage does not take place with them until the girl is of age, and the union follows immediately after, unless prevented from sickness. |
| | 42 | 19 | 12 | 14 | 6 months after. | |
| | 43 | 30 | 13 | 18 | One month after. | |
| | 44 | 31 | 11 | 17 | 3 years after. | |
| | 45 | 36 | 14 | 17 | 2 years after. | |

| Caste. | Running No. | Age at present. | Age when the Menses first appeared. | Age when the first child was born. | Time when the marriage was consummated after puberty. | Remarks. |
|---|---|---|---|---|---|---|
| SOODRAS OF CASTE. | 46 | 24 | 11 | 16 | Under 16 days. | |
| | 47 | 26 | 11 | 17 | After 3 years. | |
| | 48 | 30 | 13 | 17 | Do. | |
| | 49 | 35 | 13 | 15 | 2 months after. | |
| | 50 | 36 | 13 | 31 | One month after. | Not commenced for nearly 17 years after marriage. |
| | 51 | 37 | 14 | 32 | Under 16 days. | Do. Do. |
| | 52 | 38 | 13 | 18 | Do. | |
| | 53 | 42 | 15 | 20 | After 1 year. | |
| | 54 | 52 | 13 | 16 | Under 16 days. | |
| | 55 | 56 | 12 | 14 | Do. | |
| PARIAHS. | 56 | 23 | 11 | 18 | 5 years after. | |
| | 57 | 25 | 13 | 17 | One month after. | |
| | 58 | 30 | 12 | 14 | Do. | |
| | 59 | 31 | 14 | 18 | Do. | |
| | 60 | 32 | 13 | 23 | 9 years after. | |
| | 61 | 36 | 12 | 14 | 6 months after. | |
| | 62 | 39 | 11 | 13 | 10 months after. | |
| | 63 | 41 | 10 | 11 | One month after. | |
| CHUCKLERS. | 64 | 15 | 12 | 15 | 8 months after. | |
| | 65 | 15 | 12 | 13 | 4 months after. | |
| | 66 | 19 | 11 | 14 | After 2 years. | |
| | 67 | 20 | 12 | 13 | 2 months after. | |
| | 68 | 28 | 12 | 17 | About 4 years after. | |
| | 69 | 34 | 13 | 16 | 2 years after. | |
| | 70 | 35 | 9 | 12 | 2 years after. | |
| | 71 | 35 | 12 | 13 | 20 days after. | |

N. B. Soodras and the two servile classes entered in this register do not marry their children until after their age of maturity, and the consummation of marriage takes place immediately afterwards, unless prevented from any of the following causes,—sickness, absence of one of the married parties, their parent or parents from home, straitened circumstances, unlucky day or month in which if the girl attain her age, want of a fortunate day to perform the nuptial ceremony, &c. as predicted by the Bramin, who is always consulted on the occasion, particularly by the Soodras."

The first thing I would here notice, is the later age for the occurrence of puberty, and, in particular, for the birth of a first child, in the table in reference to the Hindus of the Deckan, than in the returns for the Bengalee women of Calcutta, already published, as the following statement shows :—

| | Puberty. | | |
|---|---|---|---|
| Ages. | Calcutta. | Bangalore. | Both. |
| 8 | 3 | ... | 3 |
| 9 | 7 | 1 | 8 |
| 10 | 14 | 2 | 16 |
| 11 | 37 | 8 | 45 |
| 12 | 66 | 14 | 80 |
| 13 | 49 | 20 | 69 |
| 14 | 41 | 10 | 51 |
| 15 | 11 | 8 | 19 |
| 16 | 6 | 7 | 13 |
| 17 | 3 | 1 | 4 |
| 18 | 1 | ... | 1 |
| 19 | ... | ... | ... |
| 20 | 1 | . | 1 |
| | 239 | 71 | 310 |
| Aver. age. | 12 yrs. & 6 months. | 13 yrs. & 2 months. | 12 yrs. & 8 months. |

| | At birth of first child. | | |
|---|---|---|---|
| Ages. | Calcutta. | Bangalore. | Both. |
| 10 | 1 | ... | 1 |
| 11 | 6 | 1 | 7 |
| 12 | 12 | 1 | 13 |
| 13 | 13 | 6 | 19 |
| 14 | 32 | 10 | 42 |
| 15 | 16 | 11 | 27 |
| 16 | 8 | 9 | 17 |
| 17 | 1 | 14 | 15 |
| 18 | 2 | 6 | 8 |
| 19 | 1 | 4 | 5 |
| 20 | ... | 3 | 3 |
| 23 | ... | 1 | 1 |
| 30 | 1 | ... | 1 |
| 31 | ... | 1 | 1 |
| 32 | ... | 1 | 1 |
| 39 | 1 | ... | 1 |
| 50 | 1 | ... | 1 |
| | 95 | 68 | 163 |
| Aver. age. | 14 yrs. & 8 months. | 16 yrs. & 5 months. | 15 yrs. & 5 months. |

Respecting puberty, it will be recollected, that, whilst in England the average age, as deduced from 2169 instances, is 14 years 10 months; the average age calculated from the above 310 Hindu cases is 12 years 8 months, showing a difference of 2 years and 2 months.* To what extent this average for Hindostan may be altered, when it shall be taken from a larger number of example, time will probably, ere long, enable us to determine: meanwhile this difference between English and Hindus is, of course, well worthy of notice. That it is caused by the greater heat of the climate of India, I before remarked, we are not warranted, in the present state of our knowledge, to infer; the returns from the West India Islands, (whose climate equals in warmth that of Hindostan,) as far as they have gone, giving no countenance to such a conclusion. However, let the inference drawn be what it may, the facts in the Hindu tables are remarkably different, it will readily be admitted, from what Montesquieu, and Haller, and subsequent writers on physiology had supposed them to be.

In thus referring to the alleged influence of warmth of climate in accelerating the period of puberty, I may here notice a fact that was published by an eminent writer a good many years ago, and which has often been quoted in support of the prevailing opinion on this subject. I allude to Sir Charles Mansfield Clarke. His words are, "The author has known an instance of an European child who went to the East Indies at the age of six years, in whom menstruation took place at the ninth year, and continued to recur regularly during three months; but the child then returning to a more temperate climate the secretion ceased and has not yet returned. The child is now 12 years old."*

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* By an oversight, which I much regret, the average age of puberty for England was erroneously printed in my paper last Number as 14 years, instead of, as I ought to have stated it, 14 years and 10 months.

Now, this solitary instance, which has been so often brought forward in proof of the influence of climate on the menstrual function, proves nothing whatever. It is an isolated fact, whose cause may have been other than temperature. The catamenia happening to appear in the child's ninth year, when she was in India, was probably a coincidence, and, at any rate, was not necessarily the effect of climate. To show the risk incurred in drawing such a conclusion from a single case, I will mention what Professor Webb has stated, in a private letter to a friend, with the perusal of which I have been favoured—That in the Calcutta Government school, of 200 girls, Indo-British and British born, under his charge, "16 years is the average time of menstruation." "This," he adds, "I understand from our matron, who has been 30 years at the institution."

The age for a first birth is considerably later, it will be seen, at Bangalore than at Calcutta, being in the former 16 years and 5 months, and for the latter 14 years 8 months. But taking the average age for the two places, which is 15 years 5 months, we still have a social phenomenon of a very surprising kind, when compared with the age for the same event in Europe. From a register of the time of life at a first parturition in 500 women of Manchester, chiefly of the class of manufacturing labourers, I find the average age to be 23 years, whereas the period of life for a first birth in Hindustan is earlier by nearly 8 years! Moreover in the English register there is no instance of parturition under the age of 17; while in the Hindu table, one-half of the examples occurs where the mother is *under* 15.

A very curious, and I apprehend hitherto in this country unknown fact, is stated by the Baboo Modusoodun Gupta, namely, that it is enjoined in the Hindu Shastras that females shall be given in marriage before the period of the sign of puberty, and that should consummation not take place until after this event, marriage is a sin. Accordingly that it is the custom of the country to send the girl at the age of 9 years to the house of her husband, unless the latter be so distant that it cannot be done. And, further, that two ancient Hindu sages, whom he names, are of opinion, that if the marriage is not consummated before the first appearance of the catamenia, the girl becomes "degraded in rank." Testimony to the same effect is given by Professor Webb; who likewise joins the Baboo in thinking that, in those alleged instances of very early menstruation, a discharge of blood from physical injury in premature sexual intercourse is the real explanation of the occurrence: a supposition worthy of the gravest consideration when endeavouring correctly to estimate the value of the Hindu tables. At Bangalore, it would seem that this revolting custom of consummating the marriage before puberty does not obtain, the husband refraining from taking his wife to his own house till not less than sixteen days have elapsed subsequently to puberty. Customs, we know, differ in different parts of our great Eastern empire. I had occasion formerly to remark, that when we speak of Hindostan it is needful to bear in mind the diversity of manners and even morals in so vast a country. In the present instance it might readily escape the notice of a reader, when speaking of Calcutta and Bangalore, that these two cities are about as widely apart as to distance, and probably not less diverse in customs and manners, than are Copenhagen and Madrid, the capitals of Denmark and Spain.

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* On Diseases of Females, &c. vol. i. page 12.

Viewing, as we must do, with pity and disgust the infantile marriages of Hindustan, it is some consolation to learn from Professor Webb that the more intelligent Hindus of the present day hesitate not to pronounce these early marriages as the "monster evils" of their country; and in my last paper it was stated on the authority of an ancient Hindu writer, Sushruta, that if a woman under the age of 16 conceives, the child will either die in the womb, or die soon after birth, or should it live, it will always be imbecile. Notwithstanding all this, however, so enwoven is the custom with the social habits and most inveterate prejudices of the Hindus, that we can only look for change for the better by slow degrees, and as the fruit of prudent, benevolent exertion on the part of their European masters. The educating of natives for the practice of medicine, in which there is already a commencement, at the Medical College, Calcutta, whereby they will acquire rational views of human physiology, may eventually do something towards dissipating error and prejudice. But it has strongly impressed me that if the Mission stations, now so numerous in India, had each a medical missionary attached, with the means of dispensing extensively medical and surgical aid to the natives around, more might be done by this instrumentality to break through their ill customs, and introduce right views as to the bodily constitution, true character, and social position of women, than by any or all the other means that could be named. Within the last few years, medical missions have been tried by the Americans in China, and with a success (so far at least as gaining the attention, confidence, and gratitude of that suspicious people) which has never been equalled. In India the same experiment has not, to any extent, been tried; but there can hardly be a doubt that it would equally succeed. The prevalence there of eye, skin, and other kinds of surgical ailments, as well as of diseases in general, affords a field for medical missionary exertion, which, it is to be hoped, will not be overlooked by those who have the direction of missions. The scheme has this great recommendation, that, while it would propitiate the favour of the deeply-prejudiced Hindu, and open his heart to receive the missionary's religious instructions, it would, from the very outset, confer those invaluable temporal benefits which Christian benevolence, armed with European medical science, is so well able to dispense; and which, moreover, after the example of Him who "went about doing good," ought ever to be held second only in importance to the office of imparting the truths of our holy faith.*

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* I have before me a Report of the Medical Missionary Society in China, printed at Macao, containing a survey of its operations from March 1843 to June 1844. It is a document of extraordinary interest. The Society began its labours in 1838, since which period "upwards of 30,000 patients" had applied for professional assistance at the date of last Report. In Hong Kong, and in the five ports, excepting Funchau fu, viz. Canton, Amoy, Ningpo, and Shanghai, institutions exist, some of them for both in and out patients. At Hong Kong, the hospital had been open one year, in which time 3924 patients had resorted to it, of which number 566 were admitted as in-patients. One ward of the hospital has been reserved exclusively for females, most of whom have had small feet, and consequently were of the better class from the villages on the main. The expense for the support of in-patients is very small—only one-fourth of the number admitted ask for or receive any pecuniary allowance, and by far the greater proportion entirely sustain themselves. The plan at all the institutions is, that while the medical missionary is attending more especially—not exclusively—to the diseases, the other missionaries are attending to the instructing of the patients.

There is a medical class connected with the same hospital of young natives, who are zealously trained for the exercise of the medical profession.

"Every one at all acquainted with medical science in China must be aware," I use the words of the Report, "to what a low system of empirical practice it is reduced, especially in surgery, which, as a science based on human anatomy, is entirely unknown. The dissection of the body, or even *sectio cadaveris*, is utterly discountenanced, as a breach of filial piety, and as great is the antipathy to disturb or maim the dead; it will be a work of years to remove this prejudice; therefore, so long as it exists, the art of surgery will continue in the hands of quacks and empirics, unless imparted through some other channel."

We may judge of the eagerness with which the medical mission stations are resorted to, by the fact, that at Shanghai, from February 18 to April 13, 1844, little more than two months, 3764 patients were entered upon the register. The list of diseases, with the exception of certain skin complaints, differs little from what would occur in a dispensary in England; but the proportion of eye diseases seems quite enormous; these are catarrhal ophthalmia, 192; granular lids, 326; granular lids with opacity, 326; granular lids with pannus, 79; entropium, 153; ectropium, 97; trichiasis, 40; contraction of tarsi, 61; pterygium, 138; epiphora, 9; abscess of eyelid, 4; tumour of eyelid, 4; abscess of lachrymal sac, 4; fistula lachrymalis, 1; ptosis, 2; lippitudo, 88; leucoma, 89; ulceration of cornea, 236; conical cornea, 19; iritis, 6; synechia, 18; closure of pupil, 57; hernia-iridis, 15; staphyloma, 44; amaurosis, 26; near-sighted, 4; malignant ulceration of eyelid, 1; loss of both eyes, 108; loss of one eye, 73; cataract of both eyes, 58; cataract of one eye, 32; cataract incipient, 56; in all, 2366, or upwards of 62 per cent. of the whole list.

## ART. X.—*Biographical Sketch of the late Dr Thomas Trotter, Physician to the British Fleet.* (Read to the Harveian Society, on the 12th April 1845.) By ALEXANDER COCKBURN, Surgeon R. N. as President of the Society.

GENTLEMEN,—Upon the present occasion I am anxious to lay before you the memoir of some one belonging to the medical department of the navy, and I know none whose name is more deserving of being recorded in the annals of the Harveian Society than my much respected friend, the late Dr Trotter, Physician to the Fleet, under the command of Admiral Earl Howe, Lord Bridport, Admiral Earl St Vincent, and the Honourable Admiral Cornwallis.

Dr Trotter was the eldest son of John Trotter, Esq. of Melrose, in Roxburghshire, where he was born in the year 1761. At a very early age he was sent to a school at Kelso, then kept by Mr Perry, afterwards editor of the Morning Chronicle. Having finished his education at school, he repaired to the University of Edinburgh to study medicine, where he remained till 1778, when he entered the navy at the age of eighteen. Shortly after the battle between Admiral Keppel and the French fleet, his first appointment was surgeon's mate of the Berwick 74, then under the command of the Honourable Captain Keith-Stewart.

The first year the Berwick was employed in the Channel fleet, it was then common in every cruise even for a few weeks for seamen to be affected with scurvy; and Dr Trotter seems to have early directed his attention and inquiries to the causes of this disease and the means of preventing and curing it. The carpenter's mate was attacked with scurvy, but not thought to be in a dangerous state. Yet so rapid was the progress of the symptoms, that he expired while the Doctor was conversing with him, by a seaman imprudently opening a port opposite his hammock, from a current of fresh air overpowering him. Scorbutic seamen often expire when suddenly raised to the erect posture, or exposed in boats when being conveyed from their ships to the hospital. This circumstance made a strong impression on the physician's mind, and led to many valuable precepts in his future practice.

The Berwick sailed in the spring of 1780, for the West Indies in the squadron under the command of Commodore Walsingham. Soon after their arrival at Jamaica, this squadron sailed to see the homeward bound fleet through the Gulph of Florida, and in their passage back, on the 5th of October, when off Bermuda, fell in with the dreadful hurricane that caused so much distress to the islands. In this gale the whole of the ships were dismasted, some of them were obliged to throw their guns overboard. The Thunderer, Commodore Walsingham, went down in the night, and the Stirling Castle was lost on her way back to Jamaica. The Berwick Captain Stewart, being now the senior officer, ordered the disabled ships to make the best of their way to Jamaica; while in his own ship, rigged with jurymasts, he shaped his course for England. On their passage home the crew suffered dreadfully from dysentery and scurvy. Forty died before she reached the channel, and upwards of two hundred were landed at the hospitals in great distress. The sufferings of the crew were great indeed, as the medicine chest was stove to pieces in the gale, and all the delicacies of diet destroyed by the salt water; added to which they were upon a short allowance of bad water. A king's ship under such accumulated distress had seldom or never come into port. The Doctor himself was a great sufferer on this occasion.

After the Berwick had refitted, she sailed again under the command of Commodore Stewart to join the North Sea fleet, under the command of Sir Hyde Parker, and was greatly distinguished in the action with the Dutch fleet, on the 5th August on the Doggar Bank, when a Dutch 64 was sunk in the action. On this occasion Dr Trotter received the public thanks of the commodore for his services to the wounded after the battle.

In April 1782, Dr Trotter was promoted to the rank of surgeon, and appointed to the Bustle sloop of war, which remained only a few months in commission, when he was appointed to the William armed ship on the Liverpool station. This ship in the succeeding February got aground at the mouth of the river Mersey, and in consequence of the damage she received was paid off. At this time out of 750 surgeons on the navy list, only 120 were allowed a small half-pay, and Dr Trotter, not being one of those entitled to it, he, along with many others, was compelled to seek employment in the African slave trade.

The Brooks, a Liverpool Guineaman, to which he was appointed surgeon, sailed about the beginning of June. After a favourable passage of a little more than a month, they came to anchor at Cape Lee Haw, on the Gold Coast, having buried, on their passage, a seaman who died of small pox. But by taking proper precautions, the disease only extended to another of the crew, who recovered. They were detained nearly eleven months on the coast, collecting their cargo of slaves. Towards the conclusion, symptoms of scurvy, such as spungy gums, stiff joints, and rigid muscles, began to appear among them. Their diet had hitherto been boiled rice or beans, with a little palm oil, salt, and pepper, without any animal food whatever. The most corpulent, and those who seemed to fare the best, were the first and greatest sufferers. Dr Trotter urged the captain to procure vegetables and fruit for them, as several had died; but the captain of the vessel, whose disposition and character was congenial to the trade, paid little attention to the request, and left the coast with a few gallons of lime juice, ten or twelve dozen of oranges, and some small baskets of guavas. This was owing to his doubting that the disease was scurvy, which Dr Trotter had so confidently asserted it to be. This small stock was soon consumed, and the consequence was dreadful;—the decks in every corner were crowded with objects of distress, exhibiting scenes of affliction, equal to any ever recorded of this loathsome disease. After a few weeks' passage, however, to the relief of these unfortunate persons, they arrived at Antigua; having buried forty on the passage. There they obtained an abundant supply of fruit, which was served to them three or four times a-day, and soon checked the disease, as by the time they arrived at Jamaica, about a fortnight afterwards, it was entirely extirpated. Here their cargo was exposed to sale, and brought high prices.

While the ship lay in Kingston harbour, the doctor was attacked with fever, was dangerously ill, and was scarcely recovered when he arrived in England, about the end of September. He was so disgusted with the horrors of the slave trade, and the depressed state of health which he had undergone, that nothing could have induced him to take another voyage to the coast of Africa in this inhuman traffic. He therefore set out for Edinburgh with the view of resuming his medical studies at the University of that place. On his arrival he found the Brunonian doctrine in full activity, and supported by some of the most able young physicians then at the university. This doctrine, the rival to that of Dr Cullen, was more suited to captivate the imagination than to inform the judgment; also better adapted to dazzle the fancy of a speculative mind than to clear the doubts of the practical physician. It sounded strange in the ears of a navy surgeon, to hear that the scurvy could be best cured by a diet of animal food, brandy, and opium, the disease being owing to deficient nourishment and weakness of the moving fibre. Dr Milman's book on scurvy had been lately published, and gave great weight to this view of the disease. When, therefore, Dr Cullen came to treat on scurvy in the course of his lectures, an account of the scurvy among the negroes in the African ship was sent him; and Dr Cullen was so staggered with the new facts detailed, in a letter from a gentleman then present, that he said he never came to that desk so badly prepared. He, however, resumed his lecture, and said nothing more on the gentleman's letter. Dr Trotter now turned his attention more to the subject, and in the succeeding year, published his Observations on Scurvy, and combated from practice all the erroneous portion of Milman's theory, as being dangerous in the treatment of the disease.

Dr Trotter for some time after this practised as a surgeon at Wooler in Northumberland, at the same time applying to his studies preparatory to taking his degree at the university, and which he did in 1788. The subject of his thesis was *de Ebrietate*, which he fixed upon as never having been treated of before. It fell to the lot of Dr Gregory to peruse it for the press, who was highly pleased with it, and said it would be highly acceptable to Dr Cullen, and a fine subject to comment upon afterwards. On the public day of graduation Dr Cullen introduced the thesis with many compliments, and concluded with saying of the author, "Certe non Ebrius erat, qui hanc dissertationem scribebat," which convulsed the whole assembly with laughter.

He was shortly after this honoured with the thanks of the Royal Humane Society, transmitted to him by Dr Hawes, the illustrious founder of that institution. Dr Hawes observed, that the investigation of so important an inquiry in a regular scientific manner was never before thought of. It was a subject happily left to be ingeniously executed and amplified by Dr Trotter.

The next subject of the Doctor's inquiry was a review of the medical department of the navy, which was published at Portsmouth in 1789, in which he animadverts with a degree of energy and spirit upon the mode of payment of the medical officers,—the supplying of medicines and necessaries for the sick,—that showed how much he had studied the subject, and how anxious he was to bring about a change so much wanted in this department.

It is now upwards of fifty years since those animadversions were made, the improvements then suggested having been introduced by piecemeal. One of them was the gold medal to the best writer of an official medical journal, which was generously bestowed by the late Sir Gilbert Blane; and his last suggestion and improvement was the appointment of a physician general, which upon the breaking up of the public board was carried into effect, and given to our zealous and distinguished friend Sir William Burnett. Dr Trotter being again called into service in October 1789, he was appointed to the Barfleur, the flag-ship of Admiral Roddam at Portsmouth. While there he devoted much of his time to professional inquiries. Amongst these the best mode of preserving water at sea attracted his attention; and he advocated in the strongest manner the charring of the inside of the casks; and submitted the result of his experiments to the victualling board; the practical inference to be drawn from which was, that all casks to hold water at sea ought to be slightly charred in putting them together, not only the staves but also the heads.

He now began his second improved edition of Observations on Scurvy, with a new theory on that disease, and was the first physician that employed pneumatic chemistry to account for the proximate cause; but he did not, as has been usually done by theorists, build his practice upon his theory, but explained the theory by his successful practice. It had been proved by chemical philosophy that oxygen imparted floridity to the blood, and those causes which produced scurvy abstracted the oxygen from the vital fluid. The conclusion was therefore obvious, that the vegetable acids, so powerful in the cure, imparted oxygen to the blood. Whatever confidence might be attached to this doctrine, it is plain it could not weaken the best mode of cure in this dreadful sea disease. He considered the concentrated form of the citric acid equally efficacious as the fresh lemon juice, having tried it in a great many bad cases.

From this time till about Christmas 1793, he served as surgeon of the Edgar, Royal William, Duke, and Centurion, when he was appointed second physician to the royal hospital at Haslar.

In the east wing, which became subject to his attendance, he commenced a reform in every department; he issued a code of rules for the attending dispensers, nurses, &c.; he instituted a clinical ward, where he had particular cases selected, and there met his visiting dispensers every day. Many alterations and improvements were introduced by him, in regard to diet for the sick, and other comforts before unknown in the hospital; and he was ever most anxious that the sick-bed of the sailor should want for nothing that lay in the power of the physician to bestow.

On the 9th April 1794, he received his appointment from the Admiralty as physician to the fleet, under the command of Richard Earl Howe, which at this time consisted of 32 sail of the line, 8 frigates, a sloop of war, a fire ship, one cutter, 2 luggers, with the Charon hospital ship, on board of which he was ordered to embark. On the 16th he had visited the different ships, and reported their state to the commander in chief; 725 on the sick list, 53 confined to bed, 21 objects for the hospital. The medical duty and discipline in the fleet quickly partook of the utmost decision and activity. All forms of mistaken medical philosophy quickly sunk under the open and candid explanations that brought every thing new into practice. The surgeons of their respective ships were called upon for regular returns of the sick, with remarks. I beg to quote the following as a specimen from my friend Mr M'Callum, who was then surgeon of the Valiant 74.

He remarks, after giving a statement of his sick list, "the fever that has for some time past prevailed among our people has of late been diminished, and now seems nearly worn out. Those cases which have occurred latterly have been slight, with a very general intermittent tendency. Ever since its first appearance, few other complaints comparatively have occurred, and these have been of the catarrhal kind, in some degree combined with the fever; in general, however, easily cured, but equally infectious with the fever in its most distinct form."

"We have had no appearance of scurvy, although some of our men had lately before we sailed come off a long cruise, during which they had been afflicted with it. This, I hope, is owing to the very judicious supply of lemon juice and sugar."

On the 2d May, Lord Howe sailed with the fleet, and about 400 sail of convoy for different parts of the world. The French fleet of 27 ships of the line sailed from Brest nearly at the same time, under the command of Admiral Villaret, an officer of great merit. He had been selected by Robespierre, and was, under pain of the guillotine, required to take the command and put to sea at all hazards. Most of the ships of the French fleet were of their finest classes.

The ships of the British fleet were all smaller than those of the corresponding class in the French service. The hostile fleets had been at sea about three weeks, and England awaited the account of a naval action, as of an event that was to decide her future destiny. Lord Howe, after seeing the convoys to the southward of Cape Finisterre, detached Rear Admiral Montague with six ships of the line to protect the trade still farther; while his Lordship returned and cruised 100 leagues to the westward of Ushant.

On the 28th May the enemy's fleet was discovered. It was blowing extremely hard, with a heavy sea; the chace was therefore arduous and difficult. The fleets were partially engaged from this time; but a general action was prevented by the boisterous and thick state of the weather, until the glorious 1st of June, when the sun rose clear and bright, with moderate weather. It was Sunday. The enemy's fleet consisted of 26 sail of the line, the British of 25. At half-past 7, Lord Howe by a general signal directed the people to have breakfast. At half-past 8 A. M. the fleet formed in excellent and compact order, bore up on the French fleet about two miles to leeward of ours, and the Queen Charlotte, Lord Howe's ship, with the Union Jack flying at the main, about 50 minutes past 9, poured her broadside into the starboard quarter of the Montagne, the largest, perhaps the finest, ship at that time in the world, bearing the flag of Admiral Villaret. I should be happy to follow out the narrative of this great action, were it consistent with the spirit of a medical essay. It must suffice, however, to state, that the action became general, and continued till 4 P. M. Seven of the enemy's ships remained in our possession; one sunk, Le Vengeur, and about 320 of her crew perished. In the ships taken 690 were killed, 580 wounded. In the British fleet 277 were killed, and 780 wounded.

After this splendid victory the physician took care to remind the commander in chief of the professional abilities of the surgeons and assistants of the fleet; and the first mate of every ship that had passed his examination for surgeon was promoted to that rank, and a considerable increase was made to the monthly pay of every surgeon's mate in the service.

When the fleet arrived at Spithead on the 13th, Dr Trotter got the surgeons to call a meeting of their corps to address the commander in chief on the numerous defects and deficient pay of the medical department. This memorial he presented to the commander in chief, and his Lordship, when he went to London, was pleased to lay it before the Board of Admiralty, and insisted on more encouragement being given to the medical officers. In consequence of this remonstrance 200 surgeons were added to the half-pay list, which was the first step that was taken to improve the situation of the medical officers, and paved the way for all future improvements. It happened that a contagious fever prevailed in many ships of the line in the French fleet, and in the captured ships some of them were dreadfully infected with it. The consequence was that it spread very generally throughout the British fleet. Some of the captains were so alarmed at this occurrence, that they urged the physician to recommend to the commander in chief to sink the French prizes by way of safety to the British ships. After, however, visiting these ships, he reported to Earl Howe, and stated that he had no fear that the infection would be soon subdued, and that the summer season was highly favourable to the extinction of the contagion. The fleet arrived in port in twelve days. The officers were all strictly admonished in the duty they had to perform, in clearing their ships, by sending the worst cases on shore to the hospital, and cleaning and ventilating the decks, white washing, &c. The confidence which the physician's opinion gave to the officers was highly encouraging to them in their duty, and the fleet, in the space of ten days after its arrival, was considered safe from contagion. The mortality amongst the French prisoners was very great, and some of the British ships suffered severely. Upon the fleet being reported by the physician free from infection, the King, Queen, and Princesses visited the Queen Charlotte, the flag ship of Earl Howe, who was received with all that enthusiasm and joy which his victory deserved, and was presented by his Majesty on the quarter deck, with a diamond hilted sword, valued at three thousand guineas.

In the following spring after the winter cruise, a scorbutic taint became very general in the fleet. The winter had been extremely severe, and the contractors could not supply a sufficiency of fresh meat, from its being so dear and scarce. The first traces and subsequent progress of the disease were duly watched by the physician, who addressed the Admiralty on the subject, and represented the urgent necessity of a large supply of fruit and vegetables to arrest its progress. This was immediately ordered. The disease was checked and not a ship remained inactive. Soon after this the aged and gallant admiral, incapable of sustaining the anxiety of his charge, resigned his command, and was succeeded by Lord Bridport, who on the 12th of June sailed from Spithead with fourteen sail of the line, five frigates, two fire-ships, and the Charon hospital ship with the physician on board. The fleet soon arrived upon their station off Ushant; and on the 22d, when about fourteen leagues to windward of Belleisle, a strange fleet was seen between them and the land, to which the British fleet immediately gave chase and captured three sail of the line, the rest having made their escape. In this action our loss was thirty-one killed, 113 wounded. Among the latter was Captain Grindall of the Irresistible. After the action Dr Trotter was sent for to visit this officer, and in ascending the ship's side, there being a heavy sea, and the ship rolling much, he sustained a severe bodily injury, an inguinal hernia, and which he never afterwards got the better of.

On the 9th July, the Charon, with the wounded on board, left the fleet. On the 15th they put into Weymouth and landed Captain Grindall at his own house. On the 16th they arrived at Spithead, and landed the sick and wounded at Haslar. On the 15th August the Charon again joined the fleet off Groa, and distributed stock, vegetables, fruit, and porter to the different ships for the sick, which the Doctor visited the same day; and considered highly necessary, from the number of scorbutic cases on board. All the worst cases were taken on board the Charon, where the hospital diet consisted of fresh mutton broth prepared every day, the meat roasted or made into a chop if preferred, flour or rice pudding, occasional custards, eggs dressed in different ways, soft bread, baked daily, pea soup nicely seasoned, pancakes, apple dumplings; flummery with wine and sugar the supper for convalescents; tea, coffee, cocoa, wine, porter, punch, negus, &c. Nor was there ever found an excuse for not having all this on board.

On the 16th November the Charon arrived at Spithead, and landed the sick at Haslar. She was ordered to be fitted up to receive troops, and prepare for the West Indies under Rear Admiral Christian; and the medical staff was ordered on board the Medusa, a fifty gun ship, having been fitted at Plymouth as an hospital ship to attend the fleet, where, at the request of the Doctor, the Lords of the Admiralty were pleased to order the same improved diet to be supplied as was customary in the Charon, with the addition of a milk cow, which completed the hospital arrangement to the entire satisfaction of the Doctor,—complete in every thing that could be devised by him for the comfort of the sick. The Medusa joined the fleet, consisting of nineteen sail of the line, receiving from time to time the worst cases from the different ships, occasionally returning and landing the sick at Haslar and Plymouth hospital.

In this year 1798, the principal diseases in the fleet were malignant ulcer and small-pox. The latter disease had occupied much of the physician's attention; and while busily engaged in preventing and endeavouring to extirpate this loathsome disease, so often imported into our ships, the valuable discovery of the protecting and antivariolous powers of the cow-pock was published by Dr Jenner. Vaccination was begun in the fleet without delay, and carried on by the surgeons with a zeal and activity that soon brought the value of the discovery to the fairest proof. Dr Trotter then moved the surgeons to give authority to their experience of its prophylactic power against small-pox, in presenting a gold medal with suitable devices to the venerable discoverer. We believe this was the first compliment from a public body paid to Dr Jenner, as will appear in his letter of acknowledgment to Dr Trotter.

*Plymouth, February* 20, 1801.

Sir,—You are perhaps no stranger to the information of the new inoculation being directed throughout the navy by Admiralty authority. The inquiries that had been instituted in the channel for the last seven years had called the attention of the surgeons to guard against the introduction of small-pox among seamen, which in more than a hundred instances, during that time, had been imported by ships. Twenty of these have occurred within the last six months in this fleet. Amidst subjects so ill prepared for its reception, more than the common proportion of deaths has been the consequence.

Such was the tenor of our researches when Dr Jenner announced to the world the vaccine inoculation as a preservative against the variolous infection.

As far as the new practice has extended among us, it has been followed with the usual success, and so mild that the subjects of it have not been considered in the number of sick on the list.

But the value of conducting the vaccine inoculation with spirit and perseverance throughout the navy may be best estimated by calculating the seamen at 10,000 who are unconscious of having had small-pox. In this proportion I am justified by the experience of musters in infected ships. How dignified the councils of any nation that by timely precaution shall ward off so much human misery. The medical officers have not been passive spectators of an event so singular in the history of animated nature;—an event which the philosopher will contemplate with wonder, and the friend of his species view with exultation. Although secluded by their office from the earliest communication with the progress of medical science, what relates to the vaccine disease has been earnestly sought after, and the whole of your opinions and practice have excited uncommon attention.

I am, therefore, requested to present you, in the name of these gentlemen, with a gold medal and suitable devices, at once expressive of their sentiments in favour of the new inoculation and to commemorate its introduction into this department of the public service. With the more pleasure I comply with the wishes of my worthy associates, as I am confident that no token of respect bestowed on a benefactor of the human race was ever conferred from more honourable or disinterested motives. It will not be less acceptable to Dr Jenner that it comes from a body of officers connected, by the exercise of their profession, with the most brilliant period of our naval history. As far as their authority has influence, they thus offer their warmest support to the cause. The progress of truth is sometimes slow, but always certain. It is not in the nature of medical investigation long to resist the evidence of facts, and it is far less the province of medicine to check the current of charitable feelings or to circumscribe the duties of benevolence. We must therefore hope, that, while the liberal discussion it has undergone shall secure the suffrage of the enlightened mind, the love of offspring will confirm its favourable reception throughout domestic life.

Accept, Sir, in the name of my naval friends, my hearty congratulations on the honours that await your professional engagements. May the present age have the justice, and the public to remunerate what posterity will be glad to appreciate! May the medical profession have virtue and candour sufficient to acknowledge the value of your labours! May your example be a model to the rising members of that profession which you adorn! And may you be blessed with length of days to see your discoveries the means of abridging and preventing disease, pain, and deformity throughout the habitable globe. Enclosed I have the honour to transmit a list of the medical gentlemen and their stations in His Majesty's naval service. I beg, with all personal esteem and regard, to subscribe myself,

Sir, Your faithful humble Servant,

To Dr Jenner. Thos. Trotter.

### Dr Jenner's answer to Dr Trotter.

Sir,—I beg you to accept my sincere acknowledgments for the distinguished honour conferred upon me in your presenting me with a gold medal in the name of the medical officers of His Majesty's navy.

From no quarter could such a mark of attention for the endeavours I have exerted in pointing out the means of annihilating the small-pox have been received with greater pride, or with warmer emotions of gratitude, since there is no situation occupied by medical men where the value of the discovery of vaccine inoculation could be more justly appreciated. If anything could enhance the estimation in which I shall ever hold such a mark of distinction, conferred by such respectable characters, it is, that it has been presented to me by a man who has cultivated the most useful science with so much success, and introduced so many valuable improvements into the navy of Great Britain. I have the honour to be your much obliged humble Servant, EDWD. JENNER.

Dr Trotter next exerted himself to get the gin shops in Plymouth Dock and Stonehouse reduced from 300 to 100, as being destructive to the health of the seamen. In this he succeeded; for his letter to the Admiralty on the subject was submitted to the Lords of Council, and an order was sent to the Lord Lieutenant of Devon to shut up 200 of these sinks of health. The health of the fleet became so perfect under the medical discipline that was now practised, that empty hospitals and full ships were the consequence.

Dr Trotter continued his services till 1802, having been physician to the fleet for nearly nine years. No physician ever served so long in a fleet. The boat duty of the fleet for so long a period was at times severe, and in ascending the ships' sides, when there was much sea, exposed him to great danger, and most serious hurts; and from the injury he had previously received in attending a wounded officer, after Lord Bridport's action, increasing in its painful tendency, he found himself incapable of this duty without much pain and hazard. He was rewarded with a pension of ten shillings a-day, but under the restriction, that when employed in any government department, it would be withheld. He never received any half-pay either as a physician or surgeon.

The rules for the prevention of disease formed the great outline of Dr Trotter's code of health, as being suited to the naval service. There was but one opinion among the officers of the fleet, of the great perfection to which he had brought the health of the navy. He was unwearied in his exertions, and never shrunk from his duty. He was the sincere and warm friend of the medical officers, and never failed to avail himself of every opportunity to advocate their cause, and improve their situation. Of this the surgeons were duly sensible, and upon several occasions expressed their gratitude by presenting him with pieces of plate, and other marks of their gratitude. The surgeons of the squadron at the Cape of Good Hope presented him with a handsome gold snuff-box. The letter which accompanied it is so expressive of the estimation in which he was held by the corps, that I shall take leave to read it to the society.

*Cape of Good Hope, June* 1, 1797.

DEAR SIR,—The real happiness which I feel in communicating to you the deep sense of gratitude and esteem of the surgeons of the little squadron now on this station, for your able, unwearied, and in some measure successful exertions to promote the general interests of the British navy, but particularly that department of it with which they are more immediately connected, can only be exceeded by that which I am sure you will more sensibly feel, on receiving so public, honourable, and marked a testimonial of it.

At a meeting purposely held to take this subject into consideration, it was unanimously agreed to present you with a gold snuff-box; and in the name of the meeting, I am directed to beg your acceptance of it, as a token of that sense of obligation to you with which they are strongly impressed. With the most heartfelt satisfaction they have already observed a considerable improvement in the medical department, and in their hitherto neglected situation. To your unceasing labours in their behalf they are ready to ascribe a great share of it, and to you they offer their unfeigned acknowledgments, looking forward with confidence from what has already been done, and relying on your persevering exertions—of the continuance of which they gladly perceive an implicit promise in your late publication. They do not despair of seeing the plan of improvement you have pointed out ultimately crowned with complete success. That you may long continue at the head of that department, where you have been so deservedly placed, as the reward of industry and merit, and that you may, as heretofore, both by your example and precept, continue to infuse and disseminate among the navy surgeons that laudable spirit of inquiry to promote the interests of medical science by a chaste and faithful collection of facts, is the sincere and ardent wish of those in whose name this letter is written, and of him who is most truly yours, George M'Callum.

To Dr Trotter.

*Answer.*

*Portsmouth,* 11*th February* 1798.

Sir,—I have been favoured with your letter of the 1st June last, inclosing a resolution of the surgeons of His Majesty's ships at the Cape of Good Hope, and also the elegant present that accompanied it. It is no small satisfaction to me to find that the fruit of my professional studies has been favourably received by so respectable a part of the list of navy surgeons on a remote station. And this testimony of their regard shall be preserved in everlasting remembrance.

But, while I receive with the utmost sense of gratitude the assurance of estimation which their gift is meant to commemorate, I must beg leave to observe, that, in any exertions of mine which the surgeons may please to think to have benefited their establishment, I have been barely doing my duty, for the public service can never be sufficiently secured till men of superior abilities in science are duly rewarded. It may be thought that medical men occupy but an insignificant place, and fill but a trifling employment, in the great scale of national business; but the complete prevention and easy extinction of some diseases, scurvy and contagion, that on former occasions baffled all naval operations, demonstrates this to be a mistake, and which, joined to the matchless discipline of our officers at a momentous crisis, proclaim, in emphatic terms, that it is natural for an Englishman to live at sea. Accept my best thanks for the delicate and friendly manner in which you have communicated this information. And believe me most sincerely yours,

T. Trotter.

To George M'Callum, Esq.

On his retirement, the surgeons of the fleet recorded the testimony of their regard by presenting him with a set of tea plate expressive of his services, and their gratitude for his many acts of kindness to themselves. The inscription on the urn is as follows,—

Doctori Thomæ Trotter,
Classis Regiæ Medico Primario,
Multa de patriâ bene merenti ;
Hoc Munusculum,
Pignus Observantiæ Summæ,
Chirurgi Navales Lubentissime
Offerunt,
Et Publicæ Salutis, et Privatæ
Amicitiæ, Testimonium
Sacrum esse voluere—1802.

A physician to a fleet or army has a duty to perform that can but seldom come within the practice of the private physician.

The brave man who risks his life in the service of his country is exposed to hardships, dangers, and privations, unknown anywhere else. In his sick-bed he is deprived of the affectionate attendance of nearest and dearest relatives, so that he has to look to his physician alone to compensate for the want of all these comforts. Few medical men, we believe, ever received greater marks of regard and gratitude than Dr Trotter from both officers and seamen, for his visits to the ships were always welcomed with the utmost pleasure.

To conclude this notice of his public service, it may be truly said of him, that no physician ever witnessed the sick-bed under such a variety of circumstances as fell to the lot of Dr Trotter. After his retirement he practised as a physician in Newcastle. On two days in the week he gave gratuitous advice to the poor, and many thousands availed themselves of it. His infirmities increasing, he relinquished practice in 1827, and went to reside in Roxburghshire, and in 1830 to Edinburgh, where he remained for two years, and afterwards returned to Newcastle, where he died on the 5th September 1832.

His professional works deservedly rank high, and are frequently quoted as authorities by medical professors and teachers. The titles of his publications are, Medical and Chemical Essays, Treatises on Scurvy, Treatise on Nervous Diseases, Essay on Drunkenness, and several others, amongst which are an Address to the Proprietors of Coal Mines on the means of destroying Damp, a Practical Plan for Manning the Royal Navy, a small volume of Poems, and also many other contributions to the periodicals of the day.

# PART II.

## CRITICAL ANALYSIS.

### Art. I.—*Practical Observations on the Diseases most fatal to Children, with reference to the propriety of treating them as proceeding from Irritation and not from Inflammation.* By P. Hood, General Practitioner in Medicine and Surgery. London, 1845. Pp. 231.

The greater perfection which the medical art attains, the less seems to be the necessity for using those violent depletive measures almost constantly had recourse to by our predecessors. Only between thirty and forty years ago blood-letting in some form or other was employed for every disease in which pain or uneasiness was complained of, and many will recollect the lavish profusion with which blood was drawn for every complaint both in the army and navy. The diseases of children were very generally treated according to the same exact plan as those of the adult, no attention whatever being paid to the very different constitutions and capabilities of endurance between a child and an adult. The work of Evanson and Maunsell was the first regular manual in which this wholesale depletive practice was condemned, and in which it was endeavoured to be shown that many of the diseases of children could be treated with greater success by sparing the vital fluid than by draining it from the system. Dr Gooch himself had previously shown that a few diseases which were formerly considered as inflammatory, and were treated by depletion, could not be cured but by abandoning that plan and having recourse to an opposite system. What Evanson and Maunsell thus gently hinted at Mr Hood boldly attacks at its source, and attempts to prove that all or nearly all the diseases to which children are liable proceed from or are dependent on irritation, and ought to be treated as such. He shows that even those forms of disease which are held to be inflammatory, such as bronchitis, pneumonia, &c. really only exhibit, as a secondary condition, what is recognised as the inflammatory state, and, if treated as inflammatory are rarely recovered from, or leave the child with a permanently broken constitution.

The views of Mr Hood are, to a greater extent than is usually imagined, borne out by all the best late writers who have seen much practice among children. Even the valuable works of Berton,[*] of Valleix,[†] of Rilliet and Barthez,[‡] and of Bouchut,[§] though holding the phlegmasial doctrines, and recommending depletive treatment in certain cases, will be found on minute examination to have advanced a great step towards limiting the employment of blood-letting in the diseases of children. But if we take this treatise of Mr Hood's as detailing the practice which he has found to be most successful among children inhabiting a large town, we shall find that his views are, to a very great extent, supported by the late valuable researches of Lugol. Lugol attributes the great mortality among children to the existence in them of what he terms the scrofulous constitution. This, which he shows affects at least a third of the human race, and which in common parlance is simply styled delicacy of constitution, he shows marvellously increases the severity of all children's diseases, and is the especial cause of these diseases proving fatal. But he at the same time demonstrates that the use of depletive measures is the very surest way to cause these diseases to cut off the child; that, in fact, the whole treatment must be directed with the view of supporting the system. These views, then, confirmed by every one who has had any experience in the treatment of patients in a large town, among whom this delicacy of constitution is in especial met with, singularly authenticate the results at which Mr Hood has arrived; and we cannot but agree with Mr Hood in believing that when these views shall have received that general attention from the profession and public which they deserve, they will tend to reduce that excessive fatality among children resident in towns, and more nearly approximate the ratio of mortality to that of children residing in country districts.

Mr Hood's work, which is purely a practical one, and details the result of his experience, is divided into 14 chapters. 1. On Inflammation. 2. Irritation. 3. Teething. 4. Bronchitis and Inflammation of the Lungs. 5. Hooping Cough. 6. Croup. 7. Measles. 8. Scarlet Fever. 9. Small-pox. 10. Convulsions and Inflammation of the Brain. 11. Scrofula and Cachectic diseases. 12. Constipation. 13. Purging. 14. Of the Effects of Calomel on Children.

In his first chapter, the author endeavours to show, from the lax state of the fibre, from the imperfect development of the muscles, from the large proportion of fatty matter in the tissues, and the small proportion of fibrin in their blood, that the constitutions of children differ most materially from those of the adult, and that causes which would produce inflammatory action in the adult consequently only excite irritation and its consequences in the child. Hence the traces of congestion found after death; hence the effusion of serous fluid into the serous cavities; and the hepatization of the lungs, softening of the heart, &c., are all attributable to the effects of congestion produced by irritation, and not by inflammation. In proof of the further correctness of his views, the author instances the fact of the largest organ of the body of the child, the liver, being rarely or never observed with traces of truly inflammatory action; that in the so-called inflammatory affections of the serous membranes of children, it is not lymph which is effused, as it would be in the adult, but serous fluid; and that in all affections of mucous membranes in old and young, it is found that remedies which soothe are far more likely to effect a cure than those which deplete. And lastly, Mr Hood compares the morbid state of the debilitated, asthenic adult, whose blood is deficient in fibrin, with those of the child; and as he shows that all admit blood-letting to be inadmissible for the removal of the diseases to which they are liable, so must it be for those to which the child is subject. He therefore proposes to employ the term, "irritation ending in congestion," to express the form of disease to which children are liable, as one less likely to mislead than any other.

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[*] Berton, Traité Pratique des Maladies des Enfans, Paris, 1842.

[†] Valleix, Clinique des Maladies des Enfans nouveau nés, Paris, 1838.

[‡] Rilliet et Barthez, Traité Clinique et Pratique des Maladies des Enfans, Paris, 1843.

[§] Bouchut, Manuel Pratique des Maladies des Nouveau-nés &c., Paris, 1845.

The second chapter treats of Irritation, a term which, though in itself simple, is of wide and extensive bearing, as expressing organic or functional derangement, neither accompanied by nor resulting from inflammation. As irritation in the adult frequently leads on to inflammation, it is but too much the habit to consider that it must have the same result in the child. Mr Hood, however, states that his experience leads him to doubt if this ever occurs in the diseases of childhood. As in the child, however, irritation frequently very closely imitates inflammation, it becomes a matter of the first importance to be able to distinguish between them. If the irritation be mistaken for inflammation, and be treated as such, the more that depletive measures are used, the greater seems to be the necessity for their use, as the symptoms of irritation become more strongly developed. The little patient consequently sinks under what is considered the virulence of the inflammatory attack, whereas, he fell a victim to the treatment which was adopted, from an erroneous view of the disease. To illustrate his meaning, the author narrates many cases in which symptoms of irritation were mistaken for inflammation, symptoms which were aggravated by the leeching which was in most instances had recourse to, from the belief it was an inflammatory attack of the brain, larynx, or bronchii, but were almost immediately arrested by removal of the source of irritation, whether this arose from teething, indigestible food in the stomach, nervous irritation, or internal congestion from the application of cold. A few excellent remarks are made on the means by which we may, from the physiognomy and the symptoms, decide as to whether the child be suffering from irritation or not, and the whole of this chapter deserves the careful perusal of every practitioner.

In enumerating the affections to which the irritation of teething gives rise, Mr Hood calls attention to the fact that during the second year of life, a period during which most of the teeth are cut, the mortality among children is so great that it embraces a whole eighth of the general mortality. The pain and irritation produced by that process give rise to disturbance in every organ of the body, many of which are every day mistaken for inflammatory. The brain, lungs, air passages, stomach, and bowels are the organs most generally affected. The pain causes the heart to beat more quickly and irregularly than usual. This renders the distribution of the blood irregular, retards its return, induces congestion, and by being, at the same time, imperfectly oxygenated, induces all these derangements of the brain, and other organs remarked to occur as a consequence of teething. Thus listlessness and torpor going on to complete insensibility, convulsions, spasmodic affections of the windpipe, hurried respiration, with cough and mucous rattle, all of which may terminate fatally, and this often suddenly, are produced by the irritation of teething. It is these symptoms which are very generally treated, as depending on an inflammatory cause, by means of leeching, tartar emetic in solution, and free purging; and Mr Hood illustrates the danger of such practice by narrating a few cases where such remedies were used. The great similarity which the spasmodic affections of the windpipe, or the torpor, insensibility, and coma, or the convulsions bear to inflammatory affections, are all the stronger reasons for endeavouring, in the first place, to ascertain whether they arise from the irritation of teething; and our own experience fully bears out Mr Hood in his statements, that these affections in children far more frequently arise from the irritation of teething than from any other cause. Mr Hood directs in every case the gums to be carefully examined, and if the teeth be found pressing against the gums they ought to be cut out. His observations on scarifying the gums are extremely judicious, and ought to be more generally attended to. He scarifies the gums whether the teeth be near the surface or not, provided they appear to be producing irritation. He correctly remarks that, however frequently the gums may be lanced, no increased hardness follows; and he might have added, what the objectors to scarification seem to be perfectly ignorant of, that a cicatrix much more easily yields to pressure than the sound structure of the tough gum. Mr Hood has never yet seen any bad effects arise from lancing the gums; but numerous cases in which the most fatal consequences have ensued from neglect of this very safe remedy. It often happens that the gum requires lancing though the point of the tooth be protruded. This more especially happens with the canine teeth, and he relates in proof a case in which a girl lost for three or four days the power of walking, which was restored by scarifying the gum around the prominent point of the canine tooth. Neglect of this remedy frequently gives rise to convulsions, squinting, water on the brain, and various spasmodic affections; hence the reason why nurses look with so much dread to the cutting of the canine or *eye* teeth. Fever, diarrhœa, &c. are also common attendants on dentition. But they rapidly yield to scarification of the gums, with soothing, and then tonic remedies.

Bronchitis and Inflammation of the Lungs form the subject of the fourth chapter. In it Mr Hood with great ability shows the essential difference between these diseases in the adult, and what are usually termed the same in the child. In inflammation of the chest in the adult the breath is short; he cannot take a full inspiration; he endeavours to preserve the utmost quiet for fear of inducing the pain, and the sputa are brown. In the so-called analogous disease in the child the breathing is quick and hurried, like the panting of an over-fatigued animal; the child is continually tossing itself about and changing its posture, and the sputa consist entirely of mucus. Mr Hood then shows that the examination of the bodies of those children who die of this affection exhibit simply marks of congestion of the lungs, and quotes M. Billard as stating, that in the autopsies at the Hospice des Enfans Trouvées, the congestion was invariably found most marked in the most dependent portion of the right lung, a circumstance for which even M. Billard accounts, by stating that in that hospital the infants are always laid on their right side. This fact, then, of itself proves that the congestion of the lung giving rise to the hepatization is owing to a simple mechanical cause, and is not the result of inflammatory action, otherwise the morbid portion of the lung would, as in the adult, be found over all parts of that organ. Mr Hood therefore agrees with M. Billard that the so-called "pneumonia of infants is the result of a stagnation of blood in their lungs." Instead, however, of viewing this stagnation as the result of inflammatory action, he shows that it proceeds from the very opposite cause, viz. atony, exhaustion. The child has for several previous days had a catarrh, with a troublesome cough and expectoration of mucus. Its rest has been broken, it has become exhausted, the heart's action has diminished in force, the mucus less perfectly expelled accumulates in the lungs; this mechanical obstruction to the breathing increases the debility or atony, and favours congestion in the lungs; the blood, therefore, becomes more or less stagnant, the face assumes a purple hue, the respiration is panting and hurried, the heart beats vehemently but powerlessly, and the child appears in imminent danger of suffocation. It is to relieve this state that M. Billard, and almost all practitioners, apply from two to six leeches; but Mr Hood shows that this practice tends to increase still further the causes on which the congestion depends, and leads on more surely to a fatal result.

Mr Hood, therefore, advises that in the first stage emetics of ipecacuan should be given with or without tartar-emetic. This relieves the breathing, determines to the skin, and often moves the bowels also. If difficulty of breathing and preternatural heat of skin remain, the child should be put into a warm bath; and for this purpose it is recommended to wrap the child in a small blanket, and immerse it thus in the water. The whole body is thus excluded from the air, and the danger of fresh cold avoided. In bad cases it is also advisable to apply some stimulant liniment to the chest, of which he prefers one composed of *Liniment. Camphor. Comp.* one ounce; *Tinct. Cantharid.* two drachms; and *Spirit. Camph.* six drachms. He at the same time administers some mild opiate cough mixture, such as syrup of poppies with *Liquor Acet. Ammon.* or with tartar-emetic wine, or if the cough be very irritating, he adds oxymel of squills and compound tincture of camphor.

In the stage of congestion, or inflammation as it is termed, the lungs must be first unloaded of the accumulated mucus by means of an emetic, when the child must be put into a warm bath, and stimulants administered to prevent an increase of debility. *Spirit. Ammon. Aromat.* ten drops, with one drachm of *Syrup. Croci*, and two of water, answers well for a child six months old, increasing the dose according to the age. Stimulant embrocations are then to be used, and the same general treatment adopted as in the first stage. If the liniment does not appear to relieve the lung sufficiently, a small blister may be applied for four hours, a piece of tissue paper being put between it and the skin. If the blister should tend to produce sloughing of the skin a poultice made with one drachm of the *Liquor Plumbi Diacetat.*, one drachm of laudanum, six ounces of distilled water, and bread crumb, gives instant relief. Valuable directions are given for the treatment of the œdema of the lungs, enlargement of the glands, and chronic bronchitis consequent on this congested state of the lungs; the object in all being to soothe, support, and strengthen the system. The author does not appear to have made trial of the acetate of lead for the relief of the catarrhal symptoms which precede and attend congestion of the lungs. We have often derived more benefit from it in combination with opiates, an emetic having preceded its employment, than any other remedy we have used.

If we consider that Mr Hood, in his above-mentioned treatment, means it to apply to children from one to five years of age, in whom primary or idiopathic pneumonia very rarely occurs, we shall find that his views are to a great extent supported by MM. Rilliet and Barthez, who condemn blood-letting and blisters in any form of pneumonia excepting the idiopathic, and counsel soon to have recourse to tonics, as much harm results from too long a persistence in antiphlogistic means.

Hooping cough next engages the author's attention. He considers it as undoubtedly of a spasmodic nature, and not inflammatory; the disturbance in the circulation, &c. being simply produced by the continued irritation of the spasmodic cough. He attributes the great mortality observed among children affected with hooping cough to the erroneous views of its being connected with an inflammatory state. When children have been suffering from interruption to the circulation of blood through the brain, in consequence of the severity of the disease, and it has been judged necessary to abstract blood without delay, the author has seen the whole symptoms suddenly brought to a favourable conclusion by the administration of a few drops of hydrocyanic acid. Mr Hood cautions against abstracting blood on any account, more especially as this complaint very generally attacks the child on its recovery from measles or scarlet fever, whilst it is still in a very debilitated state. So long as this disease is in its first stage, that is, resembling ordinary bronchitis, it is to be treated as such, and the moment the fever somewhat abates, and the characteristic cough is apparent, hydrocyanic acid is to be administered. One drop of this acid may be given to a child six months old twice a-day, increasing the dose to three drops twice a-day to one of two years old. This is acid of Scheele's strength. It is always safe to begin with the smallest dose, and combination with an alkali does not prevent its peculiar action. Mr Hood's formula is, syrup of poppies, a drachm and a half; dilute hydrocyanic acid, three to six drops; bicarbonate of soda, six grains. Half twice a-day for a child of two years. The chronic bronchitis, which sometimes remains after the peculiar spasmodic cough has left, is most easily removed by dilute sulphuric acid, with alum and sedatives. As adjuvants, frictions down the spine, with camphor liniments, Roche's embrocation, or garlic, sponging the chest and arms, change of air, &c. are found useful.

Croup is viewed as a spasmodic disease, arising from irritation of two kinds: 1*st*, A child is suddenly seized with a gasping for breath, throws back its head, becomes black in the face, and sometimes expires before assistance can be procured. This form is unquestionably spasmodic, and depends on the irritation of teething. It is, in truth, one variety of the affection described as crowing inspiration, spasm of the glottis, or *laryngismus stridulus*, and thymic asthma; and is not in any way inflammatory. *2d*, The child has sometimes a slight cold, with hoarseness and wheezing, when it is awaked by gasping for breath, and presents all the signs of croup. The author thinks this form also spasmodic, the thick albuminous secretion which lines the trachea being probably thrown out to defend the delicate membrane of the trachea from the irritant secretion induced by the previous catarrh. This explanation possesses some degree of probability. But the distinction seems to be one of words rather than things. It is spasmodic, and gives rise to spasmodic actions. But the best authorities have always regarded it as arising from the process of inflammation in the mucous membrane of the trachea and *bronchi*.

The most successful plan of treatment Mr Hood found to be the administration of emetics, so as to produce full vomiting, but not prostration of the system, and the application of a stimulant liniment, composed of one ounce and a-half of the compound camphorated liniment, with four drachms of the tincture of cantharides. A dose of calomel to unload the bowels follows.the emetic. When the bowels are moved, Mr Hood orders the half of the following mixture to be taken every four or six hours, the dose being proportioned to a child three years of age. Dilute hydrocyanic acid, two drops; carbonate of soda, three grains; tincture of opium, two drops; syrup of poppies, one drachm; and anise water, seven drachms. He repeats the emetic so soon as the spasmodic difficulty of breathing returns. During convalescence he gives dilute sulphuric acid with English paregoric elixir. For some years past we have been in the habit of treating croup on much the same principles as those advocated by Mr Hood. We never draw blood, but for the emetic give a decided preference to the sulphate of copper, which, while it produces full emesis, leaves no depressing debility, such as tartar-emetic produces; and, according to our observation, acts like acetate of lead on the mucous membrane, in restraining the morbid secretion so much to be dreaded in this affection. In the last severe case we met with, this emetic was administered twice within two hours, and being followed by a strong purgative of calomel, and the warm bath, removed completely all the dangerous symptoms within eight hours. Since we adopted this plan of treatment we have never lost a patient from this disease. If the child is under three years of age, however, we invariably carefully inspect the mouth, and if there be the slightest appearance of swollen gums, lance them freely.

Under measles nothing new, as to treatment, is stated. Mr Hood treated the bronchitis and other complications in the same manner as if they were independent diseases. He does not draw blood in any circumstance.

The simple form of scarlet fever requires no treatment, but the author states that he has found the exhibition of a few drops of dilute sulphuric acid given three times a-day, contribute to bring it to a favourable termination. In the malignant form the great object is to preserve the strength of the system. Blood-letting in any form is therefore decidedly objected to. An emetic is recommended, and then quinine with sulphuric acid, tincture of hops and of henbane every four or six hours, till the typhoid symptoms somewhat abate. Afterwards the sulphuric acid may be given alone, or the carbonate of soda with aromatic spirit of hartshorn and decoction of cinchona may be substituted. An opiate of Dover's powder at bed-time is likewise administered. The affections of the tonsils and throat are treated on the tonic and stimulant plan, and the success which, in his hands, this practice has had, is such that the author considers the disease has thereby been deprived of half its terrors. The quinine and sulphuric acid internally, a very hot linseed poultice round the throat, followed by a stimulant embrocation, and nourishing food with stimulants, and gargles of hydrochloric acid or tincture of myrrh, comprise his plan of treatment.

The same form of treatment will be found most applicable to that diffuse and general affection of the cellular tissue below the angle of the jaw, which in certain epidemics proves fatal to nearly all affected by it. Dr Corrigan relates that not above 1 in 99 cases recovers; but we need not wonder at this when we reflect that his treatment consists in the application of leeches "in relays, three or four at a time, in such a manner as that there shall be from the part a continual weeping of blood." Fatal experience, however, fails to teach those who have formed a theory on the subject, and the fatality of this treatment did not induce Dr Corrigan to modify his in any respect, though he had the candour to confess that "in 99 cases out of 100, even these (application of leeches) fail in checking its progress." In our own practice we have found the fatality attending this complication of scarlatina not greater than that attending the severe forms of that eruptive disease, when it was treated by stimulants and tonics, as wine and quinine, or bitter infusion with carbonate of soda, beef tea, &c. To the local swelling was applied a very dilute ointment of iodine spread over a rag, and over the whole a warm poultice, which was renewed at intervals. In the cases where resolution was not effected by this means, the abscess was limited, and it was only in neglected cases, or where the disease had gone on too far before being seen, that the muscles were extensively exposed by the sloughing of the cellular tissue. By this mode of treatment not above one in seven cases in which such complications of scarlatina occurred proved fatal.

There is nothing novel in Mr Hood's mode of treating small-pox, nor does he appear to employ opiates in such large doses, or trust so much to them for allaying irritation, as Dr Macgregor, whose practice in India we had so lately occasion to notice.

Of convulsions and inflammation of the brain, Mr Hood holds the same doctrines as with regard to the other diseases of infancy. Any source of irritation will in delicate children cause convulsions which often prove suddenly fatal. Any source of irritation will in the same children lead to congestion of blood in the brain, which first produces symptoms of excitement, commonly mistaken for and treated as inflammation, which symptoms of excitement lead on to that of depression and exhaustion, under which the child sinks. The almost invariably fatal termination of the cases of so-called inflammation of the brain in infants, when they are treated as such, and the evidence borne by Dr Gooch, of the successful treatment of certain cases by means of a nourishing tonic and antispasmodic regimen, together with Mr Hood's success in all cases, from following a similar plan of treatment, go far to prove that the old views of the disease were incorrect, and certainly demonstrate that the proper line of treatment had not been hit upon.

During the first stage, that of irritation, Mr Hood scarifies the gums, gives purgatives with calomel, or *Hydrarg. cum Creta;* or if there be the slightest suspicion that the nurse's milk is at fault, gets a healthy nurse, or if child be weaned, attends to its diet, and gives mineral acids with syrup of poppies. In the second stage, that of excitement, during which feverish symptoms are present, he never draws blood, as he never knew a case recover in which blood was drawn. He endeavours to allay the heart's action and diminish the feverish heat by a combination of opiates with salines; and if depression of the vital energies sets in, he administers the aromatic spirit of hartshorn several times a-day. Small doses of calomel and James's powder are also given, if oppression of the brain supervenes after the feverish symptoms are subdued and the tongue be dry. Speedy recovery, he finds, is best promoted by giving small doses of dilute sulphuric acid, with a few grains of sulphate of magnesia, preparatory to administering more tonic medicines. When the third stage, that of effusion, has occurred, little can in general be done; the only chance the child has is by being well supported by nourishing food, ammoniated tincture of bark, &c.

The author's remarks on scrofula and cachectic diseases are in general very judicious, but it is unnecessary to enter on the subject, seeing in our last Number we gave such a full account of the reasearches of Lugol. We may, however, remark that the author, in the employment of iodine, has apparently fallen into the British error of administering it in too large doses, the consequence of which has been, that he has not only failed to perceive its extreme value in scrofula, but has produced its baneful and irritant effects.

The remaining chapters of Mr Hood's work, on constipation, purging, and the effects of calomel, though containing nothing new, exhibit sound judgment and a thorough knowledge of the subject. Indeed, Mr Hood's whole work is a valuable contribution to our knowledge.

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## ART. II.—*Facts and Observations on Medicine and Surgery: The Gleanings of ten years of active General Practice, and having particular reference to Fractures and Dislocations, Gunshot Wounds, Calculus, Insanity, Epilepsy, Hydrocephalus, the Therapeutic application of Galvanism and Fibrinous Diarrhœa.* By JOHN GRANTHAM, Fellow of the Royal College of Surgeons of England, &c. London, 1845, 8vo. Pp. 216.

THE contents of this volume have been already before the profession in the pages of the Medical Gazette, and this circumstance will render any lengthened or minute notice of them unnecessary. It is proper, nevertheless, to advert shortly to a few of the subjects treated, and especially to any points new or unusual which deserve attention.

The volume consists of two parts; the first devoted to subjects in surgery; the second to subjects in medicine.

In the first paper, on the treatment of fractures and the best form of splints for fractures, the author recommends strongly the method of treatment by suspending the limb with the fractured bone. This method was originally contrived by M. Sauter of Constance, then adopted by M. Mayor, principal surgeon of the hospital at Lausanne, and by him strongly recommended. It consists in placing the fractured limb on a board suspended by four ropes or cords which are tied together and suspended by one single point. By this means the suspension with the complete immobility of the limb is insured; while the surgeon possesses the means of inspecting the limb from time to time, of applying dressings, of using the bistoury in opening abscesses, or making incisions if requisite, and of watching the origin or progress of inflammation or any of its effects.

In the second division of this essay, on the effect of fractures on the surrounding parts, the reader is presented with a description of the general anatomy of bone from Wilson's Anatomist's Vade Mecum, an account of the pathological relations of fibrous tissue, of cellular membrane, and of skin, in which the author does not forget to employ that barbarous term *dermis*. Then follows the diagnosis of fractured bone, in which the valuable aid of the stethoscope is duly commemorated. Next is a long admonition against the use of cold applications, which are represented to be highly dangerous, which, he says, are most injurious in cases of inflammation of the cartilaginous, fibrous, tendiuous, or muscular structure.

He is a strenuous advocate for the use of splints, and regards them as indispensably necessary in keeping the fragments in apposition until the callus is consolidated.

He then gives a case of dislocation of the hip-joint, one of dislocation of the elbow-joint, one of gunshot wound, one of bony tumour in the *meatus auditorius externus*, one of the cicatrization of an extensive burnt surface, one of rupture of the tendon of the *rectus femoris*, and one of large calculus in the bladder of a female child.

The second part, which is devoted to various subjects in medical pathology and therapeutics, embraces a discussion on the premonitory symptoms of insanity, some observations on the pathology and treatment of epilepsy, observations on the pathology of hydrocephalus, on the use of galvanism in neuralgia, on the hurtful effects of the indiscriminate use of ergot of rye, on vaccination in early infancy, and on membranous or tubular diarrhœa.

We are sure that every well-informed medical man is aware of the importance of attending to the premonitory symptoms of insanity; but Mr Grantham, who probably thinks that many medical practitioners are either not aware of this, or are too much involved in the details of practice to think about the matter, has been at the pains to address a particular memorial to the profession on the subject.

There can be none but one opinion on the importance of full and correct knowledge of the subject; for it is then chiefly that treatment is efficient and successful. The difficulty consists in this, that in many cases of insanity, either no premonitory symptoms are observed, the disease breaking out almost at once, or, from the desire of keeping the calamity concealed, and the hope that it may subside of its own accord, the medical attendant is never sent for, till the premonitory symptoms are past and the disease is established. What, then, are the premonitory symptoms is the first question, and to this we do not perceive that the author gives any answer. All that he does, is to say that "sudden terror or protracted grief act on the brain and nervous system and end in madness: the brain responds to the mental action, and becoming deranged, reflects upon its agent the evil it has received, and thus mental derangement, though caused by the mental influence, is a subsequent effect of its own operations;" and then he adds, that "if this definition were always kept in mind, any objection to the term mental derangement would be impertinent." We regret to say, that here we cannot observe any definition whatever, and all that the passage does, is to recall to our remembrance that ingenious definition given by Polonius in his lecture on madness to the Majesties of Denmark.

> "Mad call I it; for to define true madness
> What is't but to be nothing else but mad."

And subsequently, when he traces the train of causation,

> "And he repulsed, (a short tale to make)
> Fell to a sadness; then into a fast;
> Thence to a watching; thence into a weakness;
> Thence to a lightness; and by this declension,
> Into the madness wherein now he raves,
> And all we mourn for." *Hamlet, Act* II. *Scene* IV.

At a subsequent part of the essay he tells the reader that, "As far as he has prosecuted the diagnosis of the premonitory symptoms of insanity, he has invariably found the exciting cause to exist in the spinal excito-motory system, and to be transmitted by sympathy to the brain. The primary cause or causes come under the appellation of depression, stimulation, and irritation."

Then he adds, "the fever that generally attends the early stages of insanity is of the congestive character. Congestion of the venous system is a state produced by the operation of common depressants, and marked by a diminution of the animal heat on the surface of the body, a diminution of the heart's action, and by a disturbance in the function of this or that organ which is the seat of congestion." —P. 134.

"The medical treatment demanded in each case, in which the mental disorder depends chiefly or entirely on some disordered condition of the heart, the liver, the stomach, the intestines, the womb, he recommends to be varied in each particular case, and to be conducted on general principles." And then he adduces two cases in illustration of his method of procedure.

It is thus a defect in the present performance, that the author, though aware of the importance of recognising the disease in its early stage, has nevertheless not given any directions by which the readers might be enabled with certainty to distinguish it. It is important in the treatment of all diseases to commence treatment at the first moment at which they are decidedly recognised; and it is particularly so in those of the mind, in which the derangement of intellect may be connected with an irritation of the nervous system, which, if not removed speedily, tends to establish some disorganisation in the membranes of the brain, and thereby to render the disease either difficult of removal or wholly incurable.

The author shows that he is aware that this irritation may proceed from a distinct organ, as the stomach, bowels, liver, heart, or womb, and that from these it may be conveyed by reflected action to the brain. But it would have been desirable that he should have expressed himself more clearly upon this subject, since upon its knowledge depends the method of treatment, which he properly regards as most judicious.

Mr Grantham has adverted to a defect existing in the knowledge of mental diseases possessed by the general body of medical practitioners. It seems to us both idle and injudicious to deny or conceal this fact; and we believe that, from the peculiar state of medical education, and above all, that of practice, by which no ordinary practitioner has either time or leisure to attend to the observation and study of cases of mental disorder, this must for a very long time, if not always, be the case. It seems, therefore, impossible to expect that cases of insanity can be well or effectually treated, by being left in this manner to those who have not leisure, and perhaps have not the requisite information, or the suitable accommodation and other facilities, to manage them successfully. We know, indeed, that an alleged cause of the incurability of many cases of insanity, is that of their being left in this manner to the management of practitioners either incompetent or otherwise incapable of the duty; and no complaint is more frequent than that of cases being kept too long under the care of such practitioners.

The only and the most effectual mode of counteracting this evil, would be either to place these patients at the first under the care of those who have the requisite time to attend to them and watch the changes in the disorder, or to send the patients at once to some asylum or situation, in which all the means and appliances for treatment and recovery might be obtained, and promptly and judiciously employed. Were this method adopted, there is every reason to believe, that the number of recoveries from the different forms of mental derangement would be greater; and that in all cases the duration of the attack would be shortened.

This subject is in short encompassed with many difficulties, which will require to be removed before any improvement in the treatment of the insane is adopted, and above all, before the reform which is now recommended can be carried into effect. One of the most serious of these is the difficulty of ascertaining and getting two or three medical practitioners to agree, not only on the premonitory symptoms of insanity, but on the actual existence of the disease. Though the present author seems to think it easy to define mental derangement, yet it is certain that, in a very large proportion of cases, not two medical persons who are consulted will agree in the fact of the derangement of the patient. This is proved by the daily transactions in the courts of law. What a mass of conflicting medical evidence was given in the case of Mr Dyce Sombre; and in such cases as that of the son of the poet Campbell, very opposite opinions were given as to the fact of sanity or insanity. Until medical opinions are more concordant and harmonious, it is vain to expect that the treatment of the disease can be improved or rendered efficient, or the state of the insane ameliorated.

The discussion is concluded by a sort of postscript, in which we learn that Mr Grantham is opposed to the method of treatment by non-restraint.

In the observations on the pathology of epilepsy, Mr Grantham distinguishes the disease into three varieties; cerebral epilepsy, spinal epilepsy, and cerebro-spinal epilepsy, according as the irritating agent or cause is seated in the brain, the spinal marrow, or in the brain and spinal marrow at once. This is followed by a case of epilepsy from deficient ossification of the skull, with observations on the causes by which this is produced, and the mode in which it operates, and practical inferences as to the most useful method of treatment.

The causes of this deficient, or rather, it might be sometimes named, retarded or postponed ossification, are, according to the author, deficient nutriment, the strumous diathesis, and a lack of warmth of the skin during the first seven or eight months of infantile life. This induces, he argues, cerebral congestion, epilepsy, hydrocephalus, and mesenteric disease. The sutures are observed to be more open than they ought to be, the frontal bone protruded and projecting, and the size of the head in general increased. The appropriate remedies are, support uniform and regular, but gentle, by means of a roller, and milk diet, occasionally with lime water. The effect of these measures, we are informed, is to cause the bones to recede, the sutures to gape less, and to reduce the size of the head,—accompanied, it is said, with the disappearance of the fits, and the restoration of the infant to health.

The truth of the representation now given we do not mean absolutely to call in question. It is quite clear, that at certain times, and in particular circumstances, the human brain, though a very tender and delicate organ, not only requires a certain amount of pressure and support, but appears to bear it well. But we fear that this is not applicable to all cases in which epileptic fits take place in early life. When the sutures are found gaping, and the bones receding, we are tempted to ask, is not this occasioned by pressure from within, by there being more blood in the brain and more serous fluid than there ought to be? It must require a great degree of sagacity to distinguish between epileptic and cerebral irritations from deficient support or want of uniform pressure, and those which result from the presence of excessive blood or serous fluid within the cranium. In short, it appears to us, that what Mr Grantham regards as a cause, will, in a large proportion of cases, prove to be an effect only, and that the gaping of sutures, the prominence of the bones, and the enlargement of the head generally, are effects which naturally follow the internal disease, and that by their occurrence the functions of the brain are continued, and life is prolonged for a longer time than they would be did these effects not take place.

Then follow some observations on the therapeutic effects of galvanism in palsy and in neuralgia. The kind of palsy in which Mr Grantham finds this agent most appropriate and beneficial, is that incident to the class of men called block-printers,—persons who are occupied in striking into pieces of calico certain combinations of colours, by the blows of a mallet held in the left hand, while the right hand and arm are used in placing the block, first in the colouring matter, and then on the cloths to be printed or stamped. The loss of power appears to be the result of excessive straining exertion of the muscles of the right arm, hand, and leg, and usually shows its presence by the individual feeling inability to dip the block grasped by the right hand into the sieve containing the colouring liquor. It appears that the remedy was completely successful in the cases recorded; and it further is stated, that these affections in calico-printers were hitherto deemed incurable. The remedy appears, from the cases given by Mr Grantham, to possess very considerable therapeutic influence.

In considering the injurious effects of the ergot of rye, Mr Grantham thinks, that, if given indiscriminately, and in cases not suited for its use, it may not only impair the contractile power of the womb, but destroy the fœtus entirely.

The fibrinous or tubular diarrhœa, or that in which a fibrinous pseudo-membranous body is discharged, he regards as the effect either of the exhibition of mercury and mercurial medicines, or the too frequent use of aperient medicine.

"Although," he says, "mercury does remove depositions of coagulable lymph or fibrin, I am fully confident it also causes a tendency to deposition of lymph. Suppose there be venous congestion of an organ during the action of mercury, so as to interfere with the normal action of the capillaries, what will be the result? An interstitial deposition. I have not presupposed such a statement; the facts have been presented to me in the usual mode of investigation, and the more I observe the complaint, the more I am convinced of the above truth. Such patients always experience an acceleration of symptoms from the use of mercury, particularly calomel, even in small doses. The disease is also found in patients who are very readily salivated, so that it is just right to admit that there may be a peculiarity of constitution when mercury produces such untoward effects. I feel that, in making the above observations, I may subject myself to some controversy; but let me entreat any one who may doubt the statement to investigate the disease for himself before he comes to any conclusion. It is a fact known to those whose practice has enabled them to examine the blood of patients under a state of ptyalism from the effects of mercury, that the blood of some patients is buffy, or, in other words, the fibrin of the blood is found separated from the rest of the crassamentum."

It must be allowed that the view here given is plausible, and has several curious facts on its side.

As to treatment, Mr Grantham recommends that the patient should reside in a situation free from malaria; should wear warm clothing, especially flannel next the skin; should use friction of the person, or at least the trunk, with oil or lard every evening, and wash the surface every morning with tepid water and soap, employing at the same time regular exercise without proceeding to fatigue. The general use of aperients, we presume he understands drastic cathartics, he condemns; but allows a teaspoonful of castor oil, when large collections of fibrin within the bowels cause uneasiness and require to be dislodged. Ammonia or soda are recommended to counteract acidity. But as tonics the use of the mineral acids is most usually indicated. An enema of warm water, gradually lowered to 50°, is directed to be employed every morning, sometimes with the addition of narcotics. Should the symptoms continue, notwithstanding the employment of these measures, nitrate of silver, in the form of enema, one-sixth of a grain night and morning, is advised to be administered. In short, all active irritating remedies he proscribes, and recommends soothing applications, and what he terms negative treatment.

As to diet, that, he says, ought to be spare and solid, that is, bread and meat, with salt and aromatics, and without any stimulants.

The use of the cod or ling liver oil is also recommended.

The volume is concluded with a short notice of a case of defect of the anterior wall of the bladder and the abdomino-pelvic parietes in a male infant, the two ureters opening between the navel, pubes, and *recti abdominis*.

Cases of this nature have now been recorded in considerable numbers; and the theory of their formation is, we believe, well understood, since our excellent friend the late Dr Duncan explained their origin.

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ART. III.—1. *Pulmonary Consumption successfully treated with Naphtha; with Cases from other medical men in support of that treatment; and an Appendix showing the utility of puncturing tuberculous cavities as an adjuvant in the cure of Phthisis.* By JOHN HASTINGS, M.D., Senior Physician to the Blenheim Street Dispensary. Second Edition, revised and enlarged. 8vo. London, 1845. Pp. 260.

2. *A Practical Enquiry into the value of Medicinal Naphtha in Tubercular Phthisis.* By EDWARD OCTAVIUS HOCKEN, M. D., Physician to the Blenheim Street Infirmary and Free Dispensary, Fellow of the Royal Medical and Chirurgical Society, &c. &c. London, 1844. 8vo. Pp. 72.

IT is a fact, of the truth of which any one who observes what is passing around him may satisfy himself, that in proportion as diseases present great difficulties in treatment, or become absolutely incurable, the number of remedies and modes of treatment is greatly multiplied. In diseases easily curable the treatment is generally simple; the remedies not numerous or positively few; and if new proposals be made for their management, they are either not adopted, or they are adopted only by a few persons more distinguished for their love of novelties than for the exercise of sound judgment. In those disorders, however, which have either continued through ages incurable, or have been so difficult to manage that recoveries could not be ascribed to the resources of the healing art, the methods of treatment have been numerous, the remedies or alleged remedies multiplied and sometimes opposite, and although all of these therapeutic methods and remedies have in turn disappointed expectation, yet the authors of new methods and remedial agents have not been thereby discouraged or deterred, but have been induced to recommend their respective measures and medicinal agents with confidence undiminished by the results of previous failure.

The truth of these observations is illustrated by the number of remedies from time to time proposed for the treatment of such maladies as gout, apoplexy, disease of the heart, consumption, cancer, and dropsy; and though daily observation and the indisputable evidence of the reports of the registrar-general must show, that most of these disorders form the great avenues or channels of human adult mortality, yet they are still believed to be under the control of the physician, and amenable to the resources of his art.

From this general character pulmonary consumption is not by any means exempt. Though the certainty with which this disease destroys its victims has been gravely but in strong colours delineated by Aretaeus; though the gay humour of Lucian had represented it as carrying by far the greatest number of subjects with the greatest degree of certainty to the gloomy regions of the other world; though Tibullus had assured us that by no other disorder has man a better chance of dying; and though all this has merely derived additional confirmation from the testimony of modern physicians and statisticians; yet such is the happy constitution of the human mind that it is still repeated, that the disease is curable, that persons have recovered and may recover, and that we possess several remedies, by the use of which patients may be restored either to health, or to such a state of strength and energy, as to have life prolonged for many years.

It is well that it is so. Truly has the poet said

> "Hope springs eternal in the human breast."

And while this principle forms one of the great means by which diseases reputed dangerous or fatal are either resisted for a time, or at length got the better of, it is also the principle to which we must refer the numerous proposals for new methods of treatment and the employment of new remedies in this distemper.

It appears from the sixth annual report of the registrar-general, which is now, by the kindness of that gentleman, lying before us, that the mortality by diseases of the organs of respiration is by far the highest, or, in other words, destroys the greatest number of the human race in these islands. In 1842, when the population of England and Wales was estimated at about 16,000,000 in round numbers, the total mortality from all causes amounted to 349,519 persons; and of these, 92,996 persons, or considerably more than one-fourth, were destroyed by diseases affecting the organs of respiration. The diseases, indeed, of this order stand at the head of all the numerous channels of human mortality; the mortality by zymotic diseases or those which act in the epidemic and endemic manner, as fevers and similar distempers, amounting to not more than 64,295.

At the head of all these diseases of the organs of respiration, as a destroyer of the human race stands pulmonary consumption, which, in 1842, brought to the grave 59,291 persons in England and Wales, more than 7000 being in the metropolis alone. In short, while consumption in its destroying powers makes a near approach to the mortality caused by the large and numerous family of zymotic diseases, it is by far the most rapacious devourer of the adults of the human race in the whole catalogue of diseases.

Does this character, this indisputable attribute, constitute a good reason for regarding the disease as unmanageable, as one on which all treatment may be abandoned, and all hopes of cure or recovery given up? This we by no means assert. A disease may cause a very large mortality, and yet may not destroy all those whom it attacks. This we know to be the case with typhous fever, which, though it causes a very high mortality, does not necessarily destroy all those attacked by it. Conversely, a disease which does not attack many persons, which, in short, is not very common, may, nevertheless, destroy all the persons whom it attacks, and allow not one individual to escape. This is the case with cancer, encephaloma, perhaps many cases of ovarian disease, and most cases of diabetes, and confirmed renal disease.

Both characters are united in consumption: and this constitutes in a great measure its peculiarity. In the British islands it is not only a very prevalent disease, but it is a disease which causes a large proportion of mortality.

The next question is, is this mortality certain? Does consumption necessarily destroy all those in whom it appears? The answer to this question it is not by any means easy to give; yet, upon the kind of answer to be given depends the propriety or even the practicability of proposing new remedies with the view of curing the disease, and thereby diminishing the numbers of those whom it carries off.

The main question, is the disease ever recovered from, we have attempted on former occasions of the same kind to consider; and we fear that the results of the inquiries then made do not hold out very decided encouragement to modify the conclusions then formed. We then showed, and it might be shown again, that many, if not all the alleged cures of phthisical cases arise from an error in diagnosis; that genuine tubercular disorganization of the lungs is a disorder which is almost never recovered from; and that one great source of error is, that other complaints with similar external symptoms, but a different internal pathological state, are occasionally mistaken for genuine consumption.*

Since the time to which we refer, several new remedies for the cure of consumption have been proposed. We have seen the vapour of tar inhaled; we have seen hydrocyanic acid given internally; we have seen iodine given or inhaled; we have heard inhalations of chlorine either alone or with hemlock, and other substances proposed and prescribed; and we have seen *aqua potassæ* recommended to dissolve the tubercular matter in the blood; and cold liver oil exhibited as a nutrient and anti-phthisical agent. Yet the mortality from this disease has not been diminished; nor has the treatment of the disease been rendered more easy or more successful. Notwithstanding the results of this experience, however, it still continues to be maintained by not a few, that consumption is a curable disease, and that remedies may be administered with confident expectations of success. It is needless almost to say that these expectations are never realised.

It is thought that all these sources of error may be now avoided by the correct and dexterous auscultator; and that the diagnosis of the physical signs of consumption is brought to so great perfection, that error is excluded, and the confounding consumption with any other similar disease, either of the lungs or other organs, is impossible. The whole of this controversy resolves itself into a question of the experience of particular individuals, and one also of the different degrees of dexterity and accuracy of different observers. We can only say this, that we still see cases of genuine tuberculation and excavation of the lungs mistaken for cases of chronic *bronchitis;* we still see cases of *bronchitis* set down as cases of phthisis; we still see cases of genuine tuberculation and *vomicæ* of the lungs overlooked and mistaken for other diseases; and we still see cases of general deranged health, with gastric or nervous cough, represented to be cases of genuine consumption, and, consequently, when recovery takes place, said to be cured.

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* Edinburgh Medical and Surgical Journal, vol. xxi. p. 159.

Another source of mistake is the different acceptations in which the term phthisis is taken, and consequently the different ideas attached to what may be allowed to constitute recovery from that disease. The term phthisis ought always to be held to mean the same thing, that is wasting and emaciation of the whole frame and its component organs, in consequence of the lungs being occupied by tubercular masses more or less extensively, and these tubercular masses proceeding or advanced to the formation of vomicæ and excavations. A distinction has been attempted to be established between tuberculation of the lungs which has not proceeded to vomicæ, and that which has proceeded to the formation of vomicæ; and in some rare instances this is found to be the case. But in the great majority of instances we find that with extensive occupation of the lungs by tubercular masses and more or less red hepatization, there are several vomicæ in the upper lobes and very general *bronchitis*, and sometimes more or less pleurisy. Thus we find several diseases united, or at least several simple lesions combined in every given case of true phthisis; and though all these simple lesions depend on the presence of the tubercular deposit and the actions thereby induced, yet the complicated nature of the pathological process operates in this, as in all similar instances of organic disease, in presenting a great if not insurmountable impediment to any single method of treatment or any single remedy, being employed with benefit or success.

But, return the advocates for the influence of new remedies, consumption is not an incurable disease. It has been shown by Laennec, that in cases with unequivocal symptoms of the presence of vomicæ and cavities, the patients have been restored to health, and have lived for several years. Then we are requested to look at the marks of cicatrized vomicæ in the lungs of patients destroyed by other diseases long after the time when the phthisical symptoms, that is if ever they existed, presented themselves. Thus we are told that all those instances of shrivelling and puckering of the apex of the lung, with a hard knot or nucleus of gray or white calcareous matter beneath them, and commonly with adhesion connecting the pulmonary to the costal pleura, are examples of a cavity cicatrized, a vomica healed.

To this statement there is only one objection; but it is rather strong; and we fear, without some additional explanation, insurmountable.

In all the cases of puckering and shrivelling of the apex of the lung, with a hard concretion below, the rest of the lung every where else has been perfectly healthy; free from tubercles; without induration of any kind; and without any appearance of vomicæ. Does this look like the lung of a phthisical person? Does it present the characters of a tuberculated lung? No one who has seen half-a-dozen inspections of tuberculated and vomicalized lungs will venture to answer this in the affirmative. The lungs so described present no resemblance to those of a person destroyed by phthisis. What evidence then have we that these cases ought to be regarded as examples of healed vomicæ or cicatrized cavities? This question the advocates for the cure of consumption can best answer.

Yet Dr Hastings informs his reader that consumption may terminate favourably; and Dr Hocken in like manner speaks with rather more confidence to the same effect.

" Pulmonary consumption," says Dr Hastings, " is not invariably an incurable disease, nor does it always necessarily advance to a fatal termination. Post mortem examinations have abundantly proved that tubercular excavations have existed in the lungs, and that cicatrization of these cavities, or, in other words, a spontaneous cure has been subsequently established;" and in support of the opinion that phthisis is not necessarily fatal, we may quote the following passage from an essay by Doctors Graves and Stokes, the highest authorities in this country on the pathology of the lungs.

" It was my intention," says Dr Graves, " to have added some observations upon several remarkable cases of phthisis which have occurred in my own practice and the practice of Dr Stokes, and in which the patients recovered, either temporarily or permanently, in a manner quite unforeseen and unexpected. In some, recovery took place after abundant tubercular deposition and crepitus; and in others, after the formation of tubercular cavities. When the disease was produced by the operation of accidental causes on a constitution apparently sound, the recovery was not so surprising; but we have witnessed recovery in many of a phthisical constitution, and several members of whose families had previously fallen victims to consumption. Facts such as these ought to prevent the practitioner from placing too great reliance upon stethoscopic examinations as a positive means of prognosis; for it may be looked upon as established, that phthisis, like most other diseases, *does not necessarily progress to a fatal termination.*"

From this statement, Dr Hastings draws the conclusion that, as confirmed phthisis may be cured, *a fortiori* incipient phthisis may more certainly be cured by the administration of remedies.

The language of Dr Hocken is, if possible, more decided.

> "As regards the curability of some stages and forms of genuine tubercular phthisis, I do not now entertain the shadow of a doubt. Cicatrized tubercular cavities have been observed and recorded by competent authorities, proving that the disease is, in its nature, curable, although the powers of the patient never effect a cure, except in those rare instances, where very limited tubercular depositions are not followed by a subsequent augmentation of the disease. Many cases in their earliest stages have doubtless been cured by change of climate and by judicious treatment, which would have gone on to the patient's destruction under less favourable circumstances; although, perhaps, these have been considered merely as threatened cases of phthisis, from a want of minuteness and accuracy in diagnosis.
>
> "Dr Marshall Hall states, that he has known the constant application of a lotion, consisting of one part pure alcohol and three parts water, to the upper regions of the thorax, just below the clavicles, effect a cure of tubercular depositions. The lotion is to be applied through the medium of a piece of soft linen, folded six times —the linen being moistened every five minutes, and free evaporation being allowed. If Dr Hall's assertions meet with assent and belief, his testimony would prove that such cases are not always incurable."—P. 2, 3.

Dr Hocken then annexes from Dr Graves and Dr Stokes part of the extract already given from the work of Dr Hastings. These are the opinions deliberately entertained and expressed by both authors on the sanability of consumption; and while it is perfectly competent for them to entertain these opinions, and to act on them, it is not less so for others to doubt their accuracy, and to question the correctness of the premises from which they are deduced. As to the authority of Dr Graves and Dr Stokes, which is here brought forward in support of the statement, that tubercular disease and vomicæ of the lung are curable affections, we must say, that, without meaning the smallest offence, we attach to it no importance whatever. In some circumstances we do not understand the reasonings of Dr Graves; and where we do understand them, we cannot see the connection between the premises and the conclusions. Dr Graves states, that he has seen cases of confirmed phthisis, with all the usual physical signs of tubercles and vomicæ, recovered from, while the patient was riding from ten to twenty miles daily on a jaunting car. To this all that we have to say is, that we do not understand it; and the cases denominated phthisical, must have been different from any, that have fallen to our lot either to see or to treat.

We are not unaware that similar doctrines have been maintained by others. But it is worthy of remark, that the evidence on which these doctrines are founded is of a mixed character. At one time our attention is directed to marks in the lungs of the dead, which are said to indicate the fact of cicatrized vomicæ; and of this kind are the cases adduced by Dr Bennett in a recent number of this Journal. Of the value of this class of facts as evidence, we have already spoken. At another time we are informed, that in cases in which unequivocal symptoms of consumption had appeared during life, recovery had been effected, and life had been prolonged. We know of no class of cases in which, after the symptoms had appeared and had subsided, and health had been restored,—and at a subsequent period the sound state of the lungs had been ascertained by inspection after death.

Even the cases given by Boudet are, we believe, referable to the same class as those given by Dr Bennett. The researches of this author are said to prove, that from the disease recoveries are effected by the efforts of nature alone. Of 45 inspections of persons between the ages of 3 and 15, he found that 12 persons had recovered from consumption of the lungs. Of 115 autopsies of persons between the ages of 15 and 75 years of age, he found that tubercles of the lungs and bronchial glands had become innocuous in 97, and had disappeared in 61 cases; while in 197 autopsies of all ages, he found 10 instances in which at least one cavern, completely cicatrized, existed in the lungs, and 8 in which one or more cavities were in different stages of cicatrization.

Upon the narrow and rather slender foundation now specified, Dr Hastings and Dr Hocken have founded the inference, that consumption may be successfully treated by well-selected remedies; and that for this purpose, naphtha, prepared in a particular manner, is the appropriate agent. When this inference was first promulgated, it was opposed with much vehemence and keenness by the great majority of the profession; nor is it wonderful that it was so opposed. A doctrine so manifestly contradicted by all past and daily experience, it was unreasonable to expect to be received quietly and without much resistance. It was, accordingly, met with much violent obloquy; and perhaps a greater amount of bitterness than was either necessary or wise was mingled in the controversy. We are far from asserting that the inference is wholly erroneous; much less can we allow that it is well founded. But we think it forms a just subject of inquiry, whether it be true to the extent represented by its advocates, and whether it be justified by facts well known to the profession. Whatever notice of it we propose at present to give, we shall study to present merely an account of the remedy, the mode of its administration and its alleged effects, without pretending to vouch for the correctness of the statements made regarding these effects. That can be determined not by one or two persons, or at the present time, but only by repeated trials by many observers; and it will only be after a considerable time that the profession will be in a condition to form a just opinion on the actual merits of the remedy.

The treatise of Dr Hastings is more ample, and one of greater pretensions than that of Dr Hocken. The former considers in nine successive chapters the causes of the disease, gives a view of the stethoscopic and rational symptoms, explains the complications of the disease, the pathology and the diagnosis, and states shortly the various therapeutic measures which have at different times, and by different persons, been proposed for curing the disorder; and he then gives the history, medical and therapeutic, of naphtha, and illustrates his conclusions by a series of cases.

Dr Hocken confines himself almost solely to the exposition of the medical history and therapeutic effects of naphtha, illustrated by several cases.

In his view of the causes of pulmonary consumption, Dr Hastings espouses the opinion, that it is sometimes, and under favourable circumstances, a contagious disorder, and that it may be and is propagated from one person to another, by contact, by sleeping in the same bed or apartment, and by breathing the same atmosphere; and he accordingly recommends, that in any institution established for the treatment of consumptive patients, they should be completely isolated from each other. It is easy to see, that if the doctrine be well founded, not only should phthisical patients not be admitted into general hospitals or other institutions, but every institution for their united or assembled management must be singularly hurtful and pernicious. It is clear, however, that no amount of authority or multitude of names is sufficient to prove this principle; and if it be easy to maintain it, it is not less easy to show many facts against it.

On the chapters intermediate between this, and that on treatment we do not propose at all to dwell. That on pathology is misnamed. It is an enumeration of the facts constituting the morbid anatomy of the disease, but gives nothing on pathology, properly so called. We expected to find in it full illustrations of the efforts made by nature to cure the disease, and every fact tending to illustrate the causes of the fatal or the favourable termination, everything in short which was to illustrate the nature of the disease as an affection curable, moderately curable, spontaneously curable, or incurable.

We must take it for granted, then, in the meantime, that Dr Hastings and, shall we add, Dr Hocken, have shown that consumption is in its nature a curable disease; and that notwithstanding the long and dreadful catalogue of lesions discovered in the bodies of those destroyed by it, there are circumstances in which these lesions are not allowed to take place, or when taking place are repaired.

Dr Hastings introduces his remedy in the following manner, in the present volume.

> "It is now a year and a half ago since the first edition of this work appeared, containing my experience of the employment of *Naphtha* in consumption. During a period of nine months the result was so encouraging, that I hastened to lay the facts before the profession, in order that the usefulness and value of this remedy might be more fully tested. The additional facts and observations contained in the present volume, it is hoped, will not be read without interest; they are selected from an extensive practice; I have also added cases treated by other medical men."

The method employed by Dr Hastings for the cure of consumption is to administer, three times a-day, from ten to forty drops of the pyro-acetic spirit in water; and in some cases, particularly when there exist tuberculous caverns, to inhale the vapour of the same spirit. Attention to dress and exercise, with the use of generous diet, constitute the remainder of his means of cure.

From Dr Hastings overlooking the correct chemical characters of this agent, and styling the pyro-acetic ether—naphtha, he has been the means of others committing unpleasant mistakes. In the present publication, though he retains the erroneous name, he has given a description of its chemical characters, and the means of ascertaining its purity.

Dr Hastings' reasons for beginning the employment of pyro-acetic ether are singular. Believing that the essential part of tubercular deposits consists of fatty matters, he concluded that by employing agents rich in carbon and hydrogen they would "not make up the deficiency in fat which the system had sustained in the progress of the disease, but that they would be productive of a change in the blood powerful enough to destroy the morbid condition which generated tubercle." For this purpose naphtha was selected; though why oil of turpentine, alcohol, sulphuric ether, or pyro-acetic spirit were not chosen, no reason is given. By chance it happened that though he ordered *naphtha*, the druggist gave pyro-acetic spirit, which was lying by him as a useless article, not being capable, like naphtha, of dissolving gums; and, as no bad results followed its use, he prescribed it in many cases. Often, however, he got what he really ordered, naphtha, and invariably found it aggravated all the symptoms. His practice, therefore, opposed his theory; for if hydrocarbons were to benefit at all, naphtha, turpentine, alcohol, or ether ought all to have acted in a somewhat analogous manner.

We find further from the account in the present volume, that various difficulties were encountered in ascertaining the exact chemical characters and relation of the agent employed. The chemists, we are informed, observed the most profound secrecy as to the source whence the agent (naphtha or pyroxylic spirit) was obtained; some asserting or allowing it to be believed that it was the product of the destructive distillation of wood; others that it was obtained by the dry distillation of an acetate; and some maintained that it was only procured from pyroligneous acid manufactures, where beech wood alone was consumed in its formation. It appears that Mr John Barry, of the firm of Allen and Co., Plough Court, Lombard Street, distilled from the acetate of lead a species of naphtha which differs from all the other varieties met with in the shops, and which we are led to understand is the one patronised and recommended by the authors as the only good medicinal naphtha. The description of this substance is given in the following passage.

After stating that naphtha was a term first applied to a natural exudation from the earth, and that the state of the chemical arts has made us acquainted with several other substances passing under this general appellation, but distinguished from each other, as the naphtha of coal tar, pyroxylic spirit, and pyro-acetic spirit, he proceeds,—

"It was my good fortune to commence my experiments with that kind of naphtha called pyro-acetic spirit, being quite unaware, at the time, that there was more than one kind; and the knowledge that I had been in this particular the 'mere sport of circumstances,' grew out of an occasional change in the druggist, and the favourable or unfavourable symptoms which followed the one or other supply. By experiment, I soon formed a criterion by which I could identify the kind of naphtha I had found to be successful. My test was its colourless and transparent character, and agreeable etherial alcoholic odour; its specific gravity, which was 0·823 to 0·824; its increase of temperature consequent upon mixture with water; its preservation of appearance on the addition of nitric acid; and its taste being warm, without the least sensation of burning. 'Dr Ure has recently suggested an easy method of effecting this object, which is founded on the following facts. If nitric acid of specific gravity 1·45 be added to pyroxylic spirit, the mixture assumes a red colour, but no effervescence takes place. If the same acid be added to pyro-acetic spirit, there will be no change of colour, but an effervescence will slowly be formed, accompanied with an elevation of temperature, and copious evolution of gas, resembling in appearance the action resulting from the mixture of alcohol with nitric acid, but with an acetic smell, instead of an etherious one. Pyro-acetic spirit may also be generally distinguished from pyroxylic spirit by its causing no appearance of milkiness on mixing with water, in the state in which it is met with in commerce.'

"The tests here submitted will be amply sufficient to distinguish the naphtha best suited to pulmonary consumption. The question as to its real nature, which is still a subject of dispute, is only important as a scientific problem, inasmuch as it more or less affects the nomenclature. The settlement of these points I must leave to the practical chemist, and although it appears that the remedy I employ is pyro-acetic spirit, I do not feel myself justified, at present, in calling it by any other name than that of naphtha."

The following is the account given by Dr Hocken.

"The physical characters of the medicinal naphtha are as follows: —When pure it is a *colourless*, limpid liquid, readily miscible in all proportions with water and alcohol, having a specific gravity at 60° F. of about ·800.

"The smell is alcoholic and peculiar—being a compound smell of alcohol and acetic æther, with something rather nauseous and bitter, but *by no means very unpleasant or disgusting*.

"The taste is warm, alcoholic, and rather nauseous—far, however, from being either very unpleasant or disgusting. Patients have invariably told me, that although they could not consider the naphtha pleasant, still it was not at all worse to take than anything else bearing the name of medicine.

"Hence if a liquid be offered for sale of a dark colour, oily appearance, or which becomes milky on the addition of water, it is obviously a non-medicinal specimen; so also if it possess a very nauseous sickly smell or taste.

"Specimens, however, may be found which agree in all these particulars, and yet belong to the non-medicinal class. I have several times tried a specimen which is more purely alcoholic in its taste and smell, and without the slight nauseous flavour and smell of the medicinal, which invariably disagreed with the patients, aggravated all the symptoms, and produced headach and sickness. These very patients had been previously much benefited by the medicinal naphtha, and were again speedily relieved from all the distressing symptoms by returning to it, and by leaving off the liquid which disagreed.

"The medicinal naphtha occasions a sense of warmth on being swallowed, usually followed by expulsion of flatus, soon succeeded by a comfortable sense of freedom of respiration, with relief of the distressing shortness of breath so constantly experienced by the phthisical. The peculiar odour of the medicine is imparted to the breath and sputa, and sometimes to the urine passed shortly after its use. In no case have I found the medicinal naphtha derange the stomach or bowels, or produce any unpleasant symptom. Hence if nausea, vomiting, or purging, faintness, giddiness, or headach, follow the exhibition of any liquid used as naphtha, it should be rejected as a non-medicinal article.

"The chemical characters of medicinal naphtha are essentially those of pyroxylic spirit (hydrate of the oxide of methule, $C_2$ $H_3$ O, aq., Liebig.) It is highly volatile, very inflammable, burning with a very pale blue flame; and the production of much heat, and boils at about 150° F. It is perfectly *neutral* to test paper, and is a ready solvent of iodine, essential oils, and resins, dissolves sulphur and phosphorus with the aid of heat, in small quantities, but exerts no action on the fixed oils.

"I submitted equal quantities of medicinal naphtha, and the non-medicinal (which I have mentioned as very closely approximating to the medicinal) to the following tests, in order to discover, if possible, some ready mode of distinguishing them.

"Tincture of litmus and litmus-paper suffer no change of colour on the addition of the medicinal naphtha, but are *reddened* in a marked manner by the non-medicinal.

"Neither turmeric paper nor reddened litmus suffer any change on the addition of either the medicinal or the non-medicinal (this specimen) naphtha."—Pp. 5–7.

He afterwards adds, that he believes that, in its real nature, medicinal naphtha must be regarded as pyroxylic spirit, being one of the products of the destructive distillation of wood. Pyro-acetic spirit obtained from the destructive distillation of acetic acid, or of the acetates of lime or copper, is a much more expensive preparation. He adds, that Dr Hastings prescribed the pyro-acetic spirit produced by the destructive distillation of an acetate, and found it efficacious, but that, as a general rule, he prescribes the cheaper spirit, which is obtained from wood.

The truth is, that there can be no doubt that the agent intended by both authors is the pyroxylic or pyro-acetic spirit, which differs greatly from naphtha.

Naphtha, the deleterious fluid, ought to be well known by its odour wherever Mackintosh cloth is found. It is used to dissolve the caoutchouc with which that cloth is prepared. If a match be dipped in it and set fire to, it burns with a dense smoky flame like turpentine. Pyro-acetic, pyroligneous, or pyroxylic ether or spirit, on the other hand, the medicinal fluid, has an agreeable etherial odour, does not dissolve caoutchouc, and burns with a pale clear smokeless flame, exactly like alcohol. In fact it is very frequently in Edinburgh used for this very purpose, being a cheap substitute for that expensive article. This last article is not known nor sold by the name of naphtha, but by that of pyroxylic, pyroligneous, or pyro-acetic spirit or ether. It appears to us right that the erroneous name, therefore, be given up, and the profession will have their prescriptions prepared with the proper article, which they cannot expect, so long as they order naphtha, and expect to receive instead thereof pyro-acetic spirit.

The physiological action of the pyroxylic spirit, or medicinal naphtha, according to Dr Hastings, is stimulating. It excites the action of the heart, exalts the powers of the nervous system, and invigorates the organs of digestion. The pulse, nevertheless, often diminishes in frequency during its use; and this in proportion, it is said, as the intensity of the pulmonary symptoms subsides, from its stimulating qualities being less exciting to the heart than the irritation maintained by the disease.

Of this treatment the result obtained by Dr Hastings has been, that among 200 cases of which he kept notes in the early stage of the disease, that is, we presume, before vomicæ were recognised, he realized 66 per cent. of recoveries; and among 62 cases in which cavities were recognised he treated two successfully, and a third reported in his first edition.

Finding the pyro-acetic spirit successful in relieving a few cases, Dr Hastings resolved to try its efficacy by using it by way of inhalation; but to fortify his opinion as to its efficacy on the solution of tubercular matter, he put some expectorated matter into it, drove off the spirit by heat, and found that the peculiar globules of tubercle were destroyed by it. The same happened when the spirit was added to tubercular matter under the microscope, or inclosed in a piece of intestine and exposed to its vapours for an hour. It may be of consequence to know that many other hydrocarbons exert the very same action, notably sulphuric ether and true naphtha, which he condemns, though Dr Hastings appears to have been ignorant of the fact.

> "In employing naphtha for the purpose of inhalation," says Dr Hastings, "the only object I had in view was, that as it destroyed the characters of tubercle after its removal from the body, it might dissipate that morbid product exposed to its fumes in cavities in the lungs, and thus remove a source of mischief from the system at large." —P. 158.

Pyro-acetic spirit is far, however, from being suited to all cases of phthisis; nay, there are many whose symptoms it aggravates, and others in which it can only be employed at certain times.

> "If naphtha," says Dr Hastings, "is employed in acute phthisis, where the cough is very harassing with slight frothy expectoration, respirations thirty to forty per minute, pulse 120 to 140, hot skin, profuse night sweats, great thirst, appetite deficient or altogether wanting, and the physical signs denoting an extensive crop of tubercles in both lungs, it will be found injurious rather than beneficial. If it is employed in chronic phthisis, coexisting with disease of other organs, its value is diminished in proportion to the extent of the complications, and their vitiating influence on the constitutional powers; if it is continued in certain cases where improvement had followed its use, after the appearance of intercurrent pneumonia, bronchitis, or pleurisy, it will do great mischief. Many such cases give way to a short course of treatment with antimony, digitalis, &c., and then the pyro-acetic spirit may be again employed with the greatest advantage."—P. 119.

And again, "Where hæmoptysis is present, or where it has recently existed, naphtha is generally contraindicated. When this is associated with tuberculous disease, as it commonly is, if it does not denote an inflammatory condition of the lung in the immediate neighbourhood whence it issues, it certainly characterises a congested state of the vessels of the part, in which state the use of all stimulants is ordinarily forbidden; although, where considerable evidence of congestion has existed, naphtha sometimes acted most beneficially. I have seen it reduce the pulse forty beats per minute, in the first forty-eight hours of its use. However, in all cases of decided spitting of blood, it will be better to wait until this latter has subsided a few days before the medicine is employed; and then ought to be combined with the tincture of digitalis, if the pulse is frequent, and other signs of high inflammatory action exist."—P. 123.

Dr Hastings appears to have found that phthisis complicated with ulcerations of the larynx, epiglottis, or trachea, with tuberculous affections of the brain, with the existence of a cavern in the lung, or with dyspepsia, were not at all benefited by the pyro-acetic spirit. Its use, however, was admissible when diarrhœa or disease of the heart were present, especially if combined with morphia and conium in the case of the diarrhœa proceeding from lesion of the mucous membrane, or with iodide of potassium, hydrocyanic acid, or colchicum in the case of disease of the heart.

As a general rule, hospital patients were not benefited by the pyro-acetic spirit treatment, which he attributes to the confined air and want of proper ventilation and exercise.

We thus see, that the class of cases proper for the specific treatment of Dr Hastings is somewhat limited; and when he asserts that, nevertheless, the proportion of recoveries is so great as 66 out of every 100 who apply during the first stage of the disease, it becomes every one to discard the prejudices he may have contracted, and in the first favourable case to give the pyro-acetic spirit a fair trial. For ourselves, we confess we put nearly as much faith in the properly adjusted regimen and diet which Dr Hastings pursues as in the pyro-acetic spirit itself; nevertheless, as it may aid the other therapeutic means employed, it deserves to have its virtues more closely inquired into.

Dr Hastings illustrates and corroborates his statements by the details of 53 cases of consumption, in different stages of the disease. To these we must refer the reader for specific proofs.

Dr Hocken gives 27 cases of consumption, in which he administered medicinal naphtha, either alone or with some other adjuvant. The results, as deduced from a table, are given in the following manner:

"Of these twenty-three patients six were under twenty years of age; three under twenty-five; two under thirty; three under thirty-five; four under forty; one under forty-five; two under fifty; and two under fifty-five,—that is between fifty and fifty-five. Eight cases occurred in males and fifteen in females.

"All the patients suffered more or less from hectic, with paroxysms of evening fever. Hæmoptysis occurred with greater or less severity in sixteen cases, and hæmatemesis (or hæmoptysis?) in one. Gout also attacked one patient twice during the course of his disease. Fourteen complained more or less of pleuritic pain in the shoulders whilst under treatment, with or withont pain in the side of a spasmodic or neuralgic character, or of pain in some other part of the chest. Two patients complained of pain in the side (of the nature already mentioned), without pain in the shoulders. Cough, shortness of breath, dyspnœa and expectoration, were symptoms common to all—varying in severity in different cases. Violent action of the heart was marked in one case only.

"More or less dulness, with resistance on percussion, was present in every case, over the diseased portions, also undue resonance of the heart sounds. The respiratory murmurs were harsh, with prolongation of the expiratory, over some portions of the diseased lung in eleven cases; faint in three; absent in one; cavernous in six; bronchial in eight; exaggerated in six, over some healthy part or side. The voice was unduly resonant over a larger or smaller portion of the affected side or sides in eight cases; bronchial in nine; whilst pectoriloquy existed in six cases. Plash on cough was very evident in two cases. Dry crepitant rhonchus with inspiration was marked in two cases; the moist in two; the mucus rhonchus in two; gurgling in eight: sibilant rhonchus in three; and sonorous rhonchus in two cases. Flattening of the chest, with more or less diminished motion on respiration, occurred in fourteen cases. A slight pleuritic friction sound existed only for a short time in one case.

"The right lung was affected alone in fourteen cases; the left in one; both lungs in eight.

"Five patients were treated by naphtha alone; six by naphtha alone with counter-irritation; thirteen by naphtha with hydrocyanic acid, opium, &c., with or without counter-irritation.

"One patient remained eight months under treatment; three for five months; one four months; four for three months; one for two months; two for seven weeks; two for six weeks; two for one month; and seven for less than a month.

"Of the results of treatment seven patients were cured; five received marked benefit both to the general symptoms, and in the physical signs; ten received much relief; and six died, one of the six, however, from disease of the brain."—Pp. 66–67.

In order to communicate a consecutive and condensed view of the whole inquiry, we think it is not possible to do better than present the general summary given by Dr Hocken in his concluding chapter.

"The analysis of these twenty-three cases," says Dr Hocken, "will be an amply sufficient answer to the question—whether this (the medicinal) naphtha could be considered as a valuable remedy in any genuine cases of tubercular phthisis?

"As regards the particular forms and stages of phthisis especially benefited, it will be seen that chronic forms are most amenable to treatment; especially where the predisposition to a phthisical death is not very powerful, and where the tubercular deposition is limited in extent. The earlier the stage of the disease at which treatment is commenced, the greater prospect is there of success, and the more speedily do they yield to its influences. Six out of the seven cases of phthisis in an early stage which I have narrated, received a complete cure from naphtha, and the seventh has been most remarkably benefited. There is little doubt that this case would have been completely and permanently cured had she not omitted the remedy every time she got a little better.

"Extensive and advanced disease, previous to the softening of the tubercles, and the formation of caverns, are, as a general rule, curable by naphtha. I have given the particulars of a most remarkable case of this kind (Case 8, Donovan). Several of the other cases were also so much benefited in their general symptoms, and received such a material alteration in their physical signs, that although some remains of disease could still be detected, they were, to all intents and purposes, cured, or would have been so by a steady continuance of the remedy, and by the most rigid attention to every circumstance preventive of relapse, and calculated to restore and preserve the tone and balance of the general health. In some other cases the patients were advancing favourably, but no chance was afforded of completing a cure by their absenting themselves prematurely.

"I have already made some remarks on the action of naphtha in phthisis, which has advanced to the stage of cavern. With the exception of some cases of limited disease, and small cavities, I believe, that in the present state of our knowledge, phthisis, in such an advanced stage, does not admit of cure.

"The beneficial action of naphtha is seen in the relief of the breathlessness of the patient, the cough, and expectoration; also in the relief of the hectic, the profuse sweating, diarrhœa, &c. Its action on the physical signs is first manifested in the diminution of the dulness on percussion, diminution of the increased resonance of the heart-sounds and voice; a softening down of bronchial breathing into simple harshness of the respiratory murmurs, with a prolongation of the expiratory; then a gradual diminution of these morbid states, and a steady return to the normal murmurs of health.

"As regards the *modus operandi* of naphtha, there is little doubt that it is taken into the circulation, and passes off mainly by the bronchial mucous membrane. This is proved by the fact that the peculiar odour of the medicine is imparted to the breath and sputa, and sometimes to the urine passed shortly after its use. Hence it is brought into immediate contact with the tubercles already deposited, with the air cells and bronchial tubes affected, and circulates through the pulmonary vessels ready to separate fresh portions of tuberculous plasma.

"The appreciable effects of naphtha seem to depend mainly on the beneficial influence which it exerts on the local disease—being secondary to this local action. In some of the cases I have given, the catamenial secretion was restored, and in others, profuse perspiration and undue secretions repressed.

" Naphtha may be used in every form and stage of consumption, except, perhaps, where deposition of tubercles excite acute inflammation, and where the progress of the symptoms is exceedingly rapid and severe—not, however, as I have already stated, with an equal chance of success in each, but with almost certainty of great relief. The naphtha should be, in some cases, combined with such other plans of treatment and medicines as the peculiarity and special indications of the disease may suggest—especially counter-irritation.

" I do not believe that naphtha by itself overcomes the tendency to consumption, but that it is capable of arresting and curing the deposition of tubercle in the lung, and I should therefore recommend all consumptive patients—especially where there was a powerful constitutional predisposition, to continue the medicine for some time after all signs and symptoms of consumption had disappeared, and to return immediately to its use on the reappearance of any threatening symptoms. Inasmuch as naphtha will not ensure the patient against some future attack, it becomes him to act as if his life depended on his own discretion, and to seek to re-establish a permanently healthy vigour in his improved constitution, by every means in his power.

" Those patients who omit the naphtha before every trace of the disease, capable of being removed, is removed; who, in fact, consider themselves well, whilst they are only convalescents, and every now and then leave off all medicine and act as if endowed with the vigour and resistance to disease of a thoroughly healthy man, are sure to remain wretched invalids, and to relapse after every such act of folly or madness. Such individuals do not give the remedy a fair chance, and therefore, in estimating the value of naphtha in their cases, it is necessary to make fair allowance for this fact.

" I believe that those patients who are wise enough to continue the naphtha for some time after the *complete cure* of their disease, and who will attend carefully to their own health, and are not very powerfully predisposed to a phthisical death, run but little risk of a return of the affection. Should any be so unfortunate as to relapse under these circumstances, they would be again speedily cured by a return to the remedy.

" No one of a properly disposed and balanced mind can refuse to give naphtha a fair and unprejudiced trial, and *attend most strictly* to all those circumstances essential to success, especially the choice of a medicinal remedy. Confinement in the house seems in some cases to be prejudicial. In certain quarters the employment of naphtha has been regarded merely as a piece of quackery and imposition, and I felt disposed to regard it as such myself before I convinced myself of its real value. No mystery has been made of the matter, and it is but an act of justice to Dr Hastings to give his treatment an unbiassed trial, and to state publicly the results. Even if the whole arose from a mere spirit of quackery, (allowing it for the sake of argument,) the judicious practitioner will not scruple to receive a valuable hint, merely because it was proposed by Mr A. or Dr B.; he will examine carefully into every practical suggestion, no matter the source from whence it springs, and will endeavour from his own experience to separate the good from the bad, the valuable from the refuse, the practical from the theoretical.

"The opinions which I have seen expressed in some quarters, appear to me to be identical with those formerly entertained of the value of mercury in syphilis, only vice versâ, viz., that if a disease believed to be syphilitic got well under any other plan of treatment than that of a mercurial one it *was not* syphilis, whilst every similar disease which was cured by mercury *was* syphilis, making mercury, in fact, a test of the disease; so in like manner some would have us believe that remedies act as a test in diseases believed to be phthisical, and that if such a disease got well under naphtha, or any other plan of treatment, it *was not* phthisis, but if the patient progressively got worse and died, the disease *was* phthisis. So much for logical argument!

"I may state, in conclusion, that I have used naphtha in several cases of disease of the chest which resembled phthisis in their general symptoms, but differed most essentially in their physical signs. In most of these cases it has proved a highly valuable remedy."—Pp. 67–70.

Such is the conclusion of the whole inquiry. It may be expected that we ought to add a few observations on the propriety of subjecting the remedy to some further trial. We have little doubt that it will be tried by many; and its actual virtues in no long time ascertained. We have made too few trials of its powers hitherto to enable us to speak with confidence. From these, however, we may say, that it appears to differ from some other agents by at least not causing harm; and it is remarkable that, while the acetic acid forms the basis of the antiphthisical remedy recommended by Mr Orban more than twenty years ago, the vapour of tar, when beneficial, which it sometimes was in *bronchitis*, must have been so, from applying to the bronchial membrane the pyroxylic spirit, which it contains. We believe, however, that it is best to leave our readers now to form their own conclusions, which, we trust, they are in a condition to do, from the facts already adduced.

One remark only have we to add. We have here seen the confident manner in which this agent is recommended by both authors, and especially by the latter. Since these observations were penned, he has himself afforded a melancholy proof of the uncertainty of medicine, the inadequacy of remedies, and the incurability of consumption. Dr Hocken has himself, we understand, fallen a victim to this cruel disorder. In the end of May he was in this city; but at that time the destroyer was evidently busy at his work. His countenance, eye, and expression bore the distinct impress of consumption, and the lungs must then have been considerably diseased. He appeared to be an intelligent and amiable man, capable of being an ornament to the profession of which he was a member. In his fate we read the lesson of the fallaciousness of human hope, and the instability of all human enterprises.

Relative to the Appendix in the work of Dr Hastings, "On the Utility of puncturing Tuberculous Cavities as an Adjuvant in the Cure of Phthisis," little need be said. The operation is a revival of that practised by Dr E. Barry of Dublin more than a century ago, and has for its object to keep the walls of the cavity in a state of rest, so as to allow of cicatrization being effected. Two patients were operated on by Mr Storks at the instance of Dr Hastings. An incision was made two inches in length over the seat of the cavity, and in one case a trochar, in the other a bistoury plunged into it. The opening was then kept free by means of a gum elastic tube fixed in the aperture. The first case operated on appeared somewhat to improve after the operation; but though the operation was performed on the 15th November, and the patient was alive six months after the operation, no very material improvement seems to have occurred. The other patient died fourteen days after the operation. Indeed, from the very short notice taken of this case, it might be inferred that the operation had hastened the fatal termination. Dr Hastings, however, thinks, from the cases so far successfully treated by Barry, Marsh, Ramadge, Storks, and Thomas, that the operation deserves a full and impartial consideration; and he even expects, that by care in selecting subjects for the operation, it will one day be enrolled in one of the allowed modes of treatment for the last stages of phthisis.

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## ART. IV.—*Animal Chemistry with reference to the Physiology and Pathology of Man.* By Dr J. FRANZ SIMON, Fellow of the Society for the advancement of Physiological Chemistry at Berlin, &c. Translated and edited by GEORGE E. DAY, M. A. and L. M. Cantab., Licentiate of the Royal College of Physicians. Vol. I. 8vo. Printed for the Sydenham Society. London, 1845. Pp. 359.

THIS is the most useful work which the Sydenham Society has yet published; and as its valuable contents are not available but to those who are members of that body, we hasten to lay before our readers a short notice of the first volume, the only one which is yet published. With the view of rendering the work more complete, Mr Day, the translator and editor, has added an introduction, containing a valuable summary of the later views on, and researches in, animal chemistry. This, though it enhances the value of the work, and renders it of greater utility to the general reader, we pass over, in order to glance at the researches of the late Dr Franz Simon. Suffice it to say, that Mr Day's summary appears to be sufficiently complete for all practical purposes, exhibits great research, and brings down the information to the present year.

The present volume of Simon's Animal Chemistry is almost entirely devoted to researches on the blood in a state of health and of disease, including, of course, the theory of respiration, the production of animal heat, &c. In a few pages are discussed the chyle and the lymph, the only other subjects treated of.

The first chapter gives a succinct account of the mode of prosecuting the proximate analysis of compound animal substances, and the characters by which these may be distinguished from each other.

In the second chapter, which occupies the remainder of the volume, the nature of the circulating fluids is considered; and first, that of the blood. For convenience sake, the blood is treated of in two sections. 1. The general physiological chemistry of the blood; under which is considered its general physiological and chemical relations; the development of the blood corpuscles; the phenomena of circulation and respiration, the metamorphosis of the blood, and animal heat. 2. The special chemistry of the the blood; under which is included the mode of analysing the blood; healthy blood; diseased blood.

1. *General Physiological Chemistry of the Blood.*—Blood, while moving in the living body, consists principally of nearly colourless fluid, in which the blood corpuscles are swimming. In the lower invertebrate animals the blood is white; it is red, however, in the annelida, colourless in most of the mollusca, but in some snails of a milk-white colour, in the *Helix pomatia* of a sky-blue, in the *Planorbis corneus* of a dark amethyst colour. It is transparent, but of different colours in insects. In the higher animals the colour of the blood is red. The blood of the mammalia, according to different authors, varies in specific gravity from 1041 to 1082. It is very questionable, however, whether such a diversity exists as M. F. Simon, from a large number of experiments on the blood of man, the ox, and the horse, found the specific gravity to vary only from 1051 to 1058; while Nasse fixed the average specific gravity of human blood at 1055, and Zimmermann at 1056. The blood of the male is usually one or two degrees greater specific gravity than that of the female, while pregnancy has been found to reduce its weight to 1045. M. Simon

found the temperature of the blood, as it issues from the aorta, to be 103° in the ox, and 95°.5 in the pig. Thackray found that of the horse to be 96°.8; of the ox, 99°.5; of the sheep, 101°.3; and of the duck, 105°.8. The blood of birds is higher in temperature than that of the mammalia. The observations of Dr Davy, MM. Becquerel, Breschet, Mayer, and Saissy tend to prove that arterial blood is nearly 2° higher in temperature than venous blood.

The microscopic analysis of the blood has engaged the attention of many observers. The red particles of the blood are invariably flattened; in the mammalia they are rounded flattened discs; in the birds, reptiles, and fishes, they are oval or elliptical flattened discs. The flattening appears to be greatest in the elliptical discs or blood globules, the thickness of the blood corpuscle of the frog not being greater than one-eighth of its long diameter, while that of man is about a fourth of the transverse diameter. The blood corpuscles are smaller in the mammalia than in the other classes of vertebrated animals; and of these, those of the ruminantia are the smallest, being to those of man as 5 is to 3. By the addition of water the blood corpuscles swell and become globular, and finally disappear from view under the microscope. The addition of a solution of sugar, of salt, of nitrate of potash, &c. renders the corpuscles again visible; they are therefore not dissolved, but simply rendered so transparent as to escape vision. The blood corpuscles have been seen to assume various forms or appearances on the addition of different reagents. Thus the margins have been seen indented, puckered, or as if studded with minute pearls; the globules have assumed a stellar appearance, or an irregular angular shape.

Besides blood corpuscles the blood contains lymph, chyle, and oil globules. The first two are globular and finely granular, the last are also globular, but are perfectly smooth, and have great refractive power.

The blood corpuscles exhibit some curious general chemical relations. Thus the capsules but not the nuclei are soluble in water, all the salts of ammonia, the carbonates of potash and soda, concentrated vinegar, &c. The corpuscles are not dissolved by nitrates of potash or of soda, phosphate of soda, chloride of sodium, sugar, sulphates of soda or of potash, &c. Bile rapidly dissolves first the capsules, and after a while the nuclei. Coneine reduces the blood to a greasy mass resembling melted wax, in which no globules can be detected. Acetic acid has different effects according to the mode in which it is applied. Thus, while Hünefeld and many others assert that this acid dissolves the corpuscle, leaving the nucleus alone, M. Simon shows that, by adding enough to cause a decided acid reaction, it renders the whole corpuscle more insoluble than ever in water, so that they may even be boiled without their form being altered. Sulphuric ether, bilin, and even plain olive oil, act very peculiarly on the blood corpuscles, in fact, in such a way as to stagger us very much as to our even yet comprehending the nature of their envelopes, certainly rendering it very unlikely that they consist of membranous sacs, as all the present microscopists would have us to believe is the case. Schultz, Hünefeld, and Simon, ascertained that blood corpuscles are dissolved by ether not exceeding in quantity the third of the blood experimented on. On the addition of the ether the colour darkens, "but ultimately the whole fluid becomes transparent." If a little bilin be added to blood, after a little stirring it becomes thick, almost gelatinous, and capable of being drawn into threads, while no corpuscles can be detected in it by the microscope. If the addition is made under the microscope, the solution of the corpuscles occurs so instantaneously that the eye cannot trace the reaction. If blood be drawn into a vessel containing olive oil, and be briskly shaken, no corpuscles can be detected in it. These three experiments, then, taken in connection with each other, and with the fact which even M. Simon admits, that the clot of blood yields more oily matter than the serum, seem to indicate that oily matter has something to do with the form or with the envelope of the blood globules.

The author, in common with Müller, Schultz, and Reichert, believes that the red colouring matter of the blood exists in a state of solution in the corpuscles. This hæmatin assumes a garnet red colour on being mixed with the carbonate, cyanate, and nitrate of ammonia, with hydrocyanic acid, with carbonates of soda and of potash, bicarbonate of soda, &c. It is coloured brown by all free acids, by ammonia, carbonate of magnesia, sulphate of magnesia, &c. Alkalis, alkaline earths, and sulphuret of potassium, produce a green tint, while it is entirely decolorized by coneine and oil of turpentine.

The nuclei of the blood corpuscles are usually about one-fourth or one-fifth of the diameter of the corpuscle itself. As the result of experiments which he narrates, the author concludes that they are closely related to the protein compounds, though not identical with any.

After a few remarks on the separation of the fibrin and the coagulation of the blood, a number of agents are enumerated, which retard or hasten the coagulation of that fluid.

The formation of the blood corpuscles is lightly touched on. The author adopts the view of Schultz, that the blood corpuscles are formed in the lymphatic glands, and are conveyed by the *ductus thoracicus* into the blood. He does not think that the liver or the spleen have any thing to do with their formation. In the lymph of the thoracic duct, on the other hand, nearly colourless blood corpuscles are actually found, as well as transparent granular lymph corpuscles. These blood corpuscles possess tender and not perfectly flattened capsules, and a much smaller amount of colouring matter than when they have arrived at maturity. The lymph corpuscles, again, and the nuclei of the blood corpuscles, present a very close analogy, and the author agrees with Schultz, that "it cannot be doubted that the blood corpuscles are produced by the formation of a coloured capsule around the lymph globules." Schultz, in addition to stating that the lymph globules which pass into the blood become converted into blood corpuscles, says that the coloured capsule of the blood corpuscle is principally formed in the process of respiration, a view which seems strengthened by the fact now generally admitted,' that the process of respiration is essentially requisite for the further development of the young blood corpuscles after their formation in the lymphatic glands. Henle and Müller take much the same views; though they think blood corpuscles may be formed under the combined influence of the vital functions in other situations, as well as in the lymphatic glands.

In commenting on the process of respiration the author gives a very excellent digest of the more recent researches on the subject. By quoting at length the very accurate and carefully-conducted experiments of Andral and Gavarret, of Scharling and of Brunner and Valentin, he shows that Lavoisier and Seguin, Menzies, Davy, and Allen and Pepys estimated much too high the quantity of carbon consumed daily. These last experimentalists calculated that the adult consumed from 11 to 13 ounces of carbon daily in respiration alone, but the former physiologists bring down the daily consumpt of carbon to somewhere about 7 ounces on the average, reaching 8 in the very muscular man, and being no more than 5 ounces in the slender girl of 19 years of age. This estimate is evidently much nearer the truth than that of Allen and Pepys, &c., and corresponds much more closely with the quantity of carbon contained in the average amount of food consumed by the adult; whereas the estimate of Allen and Pepys greatly exceeded the amount of carbon contained in all the food ordinarily consumed daily.

These experimentalists also ascertained that the quantity of carbon expired varied greatly according to the kind of food consumed, and other circumstances. Hunger and rest diminished the quantity thrown off, as did also sleep; satiety and labour increased the amount of carbon expired. Disease had also a marked influence in this respect. Brunner and Valentin, by means of carefully-conducted experiments, have shown, that, during the process of respiration, sometimes a very small quantity of nitrogen disappeared, sometimes a very small quantity appeared to be thrown off; but the result satisfied them that the variations observed in the amount of the nitrogen were entirely within the errors of observation, and that that gas may be regarded as unaltered in quantity during the process of respiration. The researches of Magnus, however, prove that the animal body does possess the power of generating or exhaling nitrogen, and this gas was invariably found by him in a free state in the venous and arterial blood. As to the oxygen, Brunner and Valentin found that its place was not replaced by an equal volume of carbonic acid, but they satisfactorily ascertained that in this respect the oxygen followed the law ascertained by Graham relative to the diffusion of gases. This law is, that gases separated by an animal membrane become mixed inversely as the square roots of their densities; consequently 1·17585 volume of oxygen gas ought to be absorbed for every volume of carbonic acid expired. According to the actual experiments it is found that 1·1742 volume of oxygen was absorbed for every volume of carbonic acid expired, or, in other words, that every volume of oxygen absorbed was replaced by ·8516 volume of carbonic acid. Respiration is, therefore, a purely mechanical process, the gases changing places according to the ascertained law of the diffusion of gases, and even in the theoretical proportions.

As to the formation of carbonic acid in the blood, the author regards the opinion of Lagrange and Hassenfratz the most probable. They thought that the blood absorbed oxygen and retained it in a state of solution, and that it was from this source that the blood globules derived that quantity requisite for their changes, and for the formation of carbonic acid. This change, they imagined occurred solely in the peripheral vessels, and for the most part in certain organs, as in the kidneys. There the combinations and decompositions took place which resulted in the formation of new products, as carbonic acid, urea, water, &c., and the carbonic acid carried by the blood to the lungs was in them replaced by a corresponding volume of oxygen. Liebig's theory of the red globules being oxygen carriers was a modification of this theory; but it was the beautiful and varied experiments of the Dutch chemist Mülder, which proved that it required both explanations to account for what actually took place. Mülder first proved that the change of colour of the blood had nothing to do with the quantity of oxygen or of carbonic acid contained in it, but that it was essentially due to the fact, that in arterial blood the globules were bi-concave; in venous blood they were bi-convex. He showed, however, that another and important change occurred. The outer covering of the blood globule, by being converted into oxy-protein, assumed the chemical characters of the inflammatory crust and became of a whiter colour. This, therefore, tended to conceal the dark-red colour of the hæmatin, and showed the colour of the arterialized or oxygenized blood as a bright red; but, when this outer crust became deoxidated, it lost its dead white colour, became again transparent, and allowed the dark-red colour of the hæmatin to become visible. Mülder, however, proved that the fibrin of the blood underwent at the lungs the very same change—by absorbing oxygen it became converted into oxy-protein; and, as the fluid fibrin is the agent principally concerned in all the changes of the body, its unions with oxygen may be after all the most important of those which occur during respiration.

The author next shows that all classes of animals, as well as their fœtuses or embryos, consume oxygen and generate carbonic acid, many also exhaling nitrogen.

For all the changes which the blood undergoes in the animal body, and for the other purposes of animal life, a certain amount of temperature is requisite. This temperature is higher than that of the surrounding medium. A very interesting table of the temperatures of some birds and mammalia is given from the works of Tiedemann and Rudolphi. From this it appears that the temperature of birds ranges from 100° to 111°; that the temperature of mammalia varies from 96° to 106°; while that of man in a state of health is from 97° to 98°, in *cholera morbus* has been seen so low as 77°, and in febrile diseases so high as 100°. The temperature of the blood itself is usually one or two degrees higher than that of the natural apertures of the body. As a general rule, the more rapid the circulation of the blood, the more perfect its exposure to oxygen, and the more rapid its change, the greater is the development of animal heat. Hence the high temperature in febrile disorders; hence the low temperature in the *morbus cæruleus*, in cholera, in the aged or debilitated whose circulation is languid, in the hybernating animals, &c. The author gives the following very curious table, drawn up from the researches of Prevost and Dumas, and amplified by his own, in order to show that the production of heat is dependent on the mass of the blood corpuscles and the rapidity of the circulation.

| ANIMAL. | BLOOD CORPUSCLES. | MEAN TEMP. | PULSE. | RESPIRATION. |
|---|---|---|---|---|
| Pigeon, . | 15·57 | 107·6 | 136 | 34 |
| Common hen, . | 15·71 | 106·7 | 140 | 30 |
| Duck, . | 15·01 | 108·5 | 110 | 21 |
| Raven, . . | 14·66 | 108·5 | 110 | 21 |
| Heron, . | 13·26 | 111·2 | 200 | 22 |
| Ape, (*Simia Callitriche*), | 14·61 | 95·9 | 90 | 30 |
| Man, . . | 12·92 | 98·6 | 72 | 18 |
| Guinea pig, . . | 12·80 | 100·4 | 140 | 36 |
| Dog, . . | 12·38 | 99·4 | 90 | 28 |
| Cat, . . | 12·04 | 101·3 | 100 | 24 |
| Goat, . | 10·20 | 102·5 | 84 | 24 |

| ANIMAL. | BLOOD CORPUSCLES. | MEAN TEMP. | PULSE. | RESPIRATION |
|---|---|---|---|---|
| Hare, . . | 9·38 | 100·4 | 120 | 36 |
| Horse, . . | 9.20 | 98·2 | 56 | 11 |
| Sheep, . . | 9.20 | 100·4 | | |
| Ox, . . | 10.50 | 99·5 | 38 | |
| Carp, . . | 2·10 | 51·1 to 51·4 | 20 | |
| Tench, . . | 1·40 | 51·4 to 52·8 | | |
| Green toad, . . | 2·20 | 51·4 to 51·8 | 77 | |

There are other sources, however, of animal heat. Thus Becquerel and Breschet ascertained that muscular contractions are attended with a development of heat—a fact which may serve to account for some of the additional heat developed under bodily exercise.

The metamorphosis of the blood in the nutrition of the organism next engages the author's attention. Regarding the blood physically, as composed of corpuscles and plasma, it is only from the latter that the organs can directly obtain nourishment. This plasma, however, is a very complicated fluid, consisting principally of albumen, fibrin, fatty compounds, salts, extractive matter, and a peculiar colouring matter, hæmaphæin. By analyzing the secretions, we ascertain that urine, sweat, and mucus, in addition to other peculiar matters, contain the same salts, colouring and extractive matters as the plasma. It is reasonable, therefore, to infer that these substances are effete matters, products of metamorphosis, not suited for nutrition. As albumen, fibrin, and fat never occur in the secretions but as symptoms of a morbid state, it is allowable to deduce the conclusion that they are the substances employed in the nutrition of the organism. It has been a question whether the plasma is merely passive in the act of nutrition, or acts partially at least along with the cells and tissues. The author concludes that it is impossible to deny it a peculiar vital power, although it apparently acts only passively, seeing it is through its agency that the cystoblastema is formed, and that from it the whole materials for the evolution of the cells are derived. The cells, in appropriating the materials contained in the plasma, must possess the power of metamorphosing those which are not of the same constitution as themselves. Hence, in converting the organic compounds of the plasma into bone, cartilage, serous membrane, sinews, neurilema, brain, &c. other compounds are formed which can no longer be considered as nutritious, and which, when met with in the plasma, must be considered as effete products on their way to be removed by the glands fitted for that purpose. The most important of these products of metamorphosis are urea, uric acid, bilin, hæmaphæin, biliphæin, extractive matters, lactic acid, salts, and mucus. The salts of the blood seem to perform some important function, otherwise they would not be in such large quantity. Some occur as constituents of the structures of the body, others are only met with in the blood. Hewson's view is probably so far correct, that one use of the large quantity of salts in the plasma is to enable the blood corpuscles to retain their discoid form, a view which seems supported by the fact, that when water is injected by a vein in quantity sufficient to dissolve or modify the form of the globules, death ensues. Another evident use of the alkaline salts is to unite with the acids taken into the system, carry them to the kidney, and allow them to pass off there. All mineral acids appear to be thus eliminated. Vegetable acids, however, are decomposed, as is proved by the fact, that when given in union with alkalies, the alkali is passed off by the kidney in the form of a carbonate, while the vegetable acid disappears. It is more than likely that the chief use of the excess of alkali in the blood is to unite instantly with the lactic, uric, and fatty acids, and probably also with the carbonic acid formed in the system during the metamorphosis of the plasma. The salts of the lactic and uric acids are partly secreted as such, partly are decomposed, the free acids being thrown off by the kidney, while the bases are retained in the plasma.

As the plasma is subjected to a continual waste, it is necessary that it receive continued supplies. This is effected by means of the chyle, and, though the fact is not mentioned by the author, it seems to have been pretty clearly proved that it is effected also by means of direct absorption of nutriment from the stomach by means of the veins. The chyle, however, not only supplies plasma, but lymph globules, chyle globules, fat globules, and blood globules; and as the former of these are supposed also to be converted into blood globules, this metamorphosis represents the real vitality of the blood. From the circumstance of there being a constant fresh supply of blood globules, the author deduces the conclusion, that there must also of necessity be a corresponding consumption of them.

After quoting from Schultz and Henle their views relative to the development of the blood globules, Dr Simon endeavours to show that it is probable the fibrin in the blood is somehow formed from the blood globules—probably from their decomposition or transformation. Of the constituents of the blood corpuscles, he endeavours, from reasoning alone, to show that it is not likely that the globulin, or hæmatin, contribute to the formation of fibrin, but that it is possibly the nuclei, which become resolved into that substance—a change "probably accompanied by the absorption of oxygen, and the separation of carbon." The only attempt at proof of the correctness of the above views is by the statement, that if they are correct we ought to find "that the amount of fibrin must always stand in an inverse ratio to that of the blood corpuscles." This, he states, is really the case; but we would require much stronger evidence than mere assertion to bear out an averment so notoriously opposed to the well-accredited fact, that the richer the blood is in blood globules, the richer is it, generally speaking, in fibrin, witness in the gouty, the high fed, &c.; whereas in the poor watery blood of the chlorotic, scorbutic, &c. the blood is notoriously deficient alike in blood globules and in fibrin. We have no hesitation, therefore, in saying, that it is most unlikely that the fibrin is derived from this source, and experiments are yet wanting to prove whence or how it is derived. Having, however, thus disposed of the nuclei, the author endeavours to show what becomes of the other principles of the blood globules during their transformations. Of the external envelopes he can give no account. The hæmaphæin, the colouring matter of the serum and of the urine, he thinks is derived from the hæmatin; and he assigns as the probable reason why so very little is met with in the blood, that it is removed from it by the kidneys as soon as it is formed from the decomposition of the blood. As proof of his theory he asserts, that, in inflammatory affections, in which, be it recollected, he allows there is a great decomposition of blood globules, there is very little hæmaphæin found in the blood; while in *melæna* and *morbus maculosus,* in which there is very little decomposition of blood globules, there exists a very large proportion of hæmaphæin. Without denying that some small portion of the hæmaphæin may result from the decomposition of the effete blood globules, even the facts stated by Dr Simon appear to us to prove that the hæmaphæin is the original magma from which the colouring matter of the blood is derived. That the hæmaphæin is the colouring matter of the food in its way to contribute to the formation of the colouring matter of the blood. The very instances adduced by the author in support of his theory seem to bear out this view. The blood globules are rapidly decomposed during inflammatory attacks. During these diseases, therefore, the hæmaphæin which results from the decomposition of the colouring matter of the blood ought to be in greater abundance if his theory were correct. But it is not so. It is in deficient quantity; and why? Because the hæmaphæin is derived from the food, and is wholly consumed, or at least consumed in greater quantity than usual, to supply colouring matter to the new blood globules, which require to be supplied at a greater ratio than before. In melæna, again, as the author allows, there is but a very slow decomposition of blood globules, there ought, by this theory, to be but a very deficient proportion of hæmaphæin in the blood. But the fact is quite otherwise. Hæmaphæin is in excess. It must, therefore, have been derived from the food, and the reason of its being in excess is, that the formation of new globules to supply the place of the old effete ones is going on so languidly that more colouring matter is thrown into the blood than is required for the wants of the system.

The author next endeavours to demonstrate that urea, uric acid, and bilin, which are definite compounds, secreted in a nearly constant ratio by particular organs, are products of the metamorphosis of the blood corpuscles, and are not found during that of the plasma in connection with the process of nutrition. Instead of these views being supported by anything like experiment or ascertained facts, they are based on the unsatisfactory foundation of vague hypothesis. Because urea, uric acid, and bilin are products of a determinate composition, and are, he asserts, found in every class of animals, and under the most opposite kinds of food, he therefore infers, they must be the products of the decomposition of some substance common to all animals. This substance, he asserts, can only be the blood globules. We cannot see the force of this reasoning, more especially, seeing that the later chemical researches have proved that, however different in external appearance be the form of food taken, the nutritious matters derived from it possess an identity of composition, whether derived from the animal or vegetable kingdoms. But the author appears also to forget that it has been distinctly proved that the nature of the food powerfully modifies and regulates the quantity of urea, uric acid, and bile secreted, which it could not do if these substances were derived from the decomposition of blood globules. That these excreted substances are also, in part, products of the metamorphosis of the effete blood globules and other effete parts of the system, no one will for a moment question; but all must allow that this will principally happen when the body is labouring under disease, when food is withheld, and when portions of the living structure are taken up to supply the necessary wants of the system, more especially that of carbon, for respiration.

2. *Special Chemistry of the Blood.*—We pass over the methods of analysing the blood and separating its different constituents, recommending them, however, to the careful perusal of all interested in such matters.

The author next proceeds to the consideration of the healthy blood in relation to physiology; and first, of the distinctive characters of arterial and venous blood. From his own analysis Dr Simon concludes that arterial blood contains less solid residue generally than venous blood; that it contains also less fat, less albumen, less hæmatin, less extractive matter and salts than venous blood; and lastly, that the arterial blood corpuscles contain less colouring matter than the venous ones. He found no fixed relation between the proportion of fibrin and of blood globules, as sometimes the arterial, sometimes the venous, contained the largest proportion of fibrin and of blood globules. It may, however, be remarked that other experimentalists have not arrived at the same conclusions. Thus, though the analysis of Denis, of Lassaigne, and of Hering agree in corroborating those of Simon, that the arterial blood leaves less solid residue than venous, they differ in showing that the fibrin in arterial blood exceeds that in venous in oxen and sheep, but that in horses the fibrin is in excess in the venous blood. Hering also found the albumen greater in quantity in arterial than venous blood. Lecanu, Autenrieth, Prevost and Dumas, and Schultz in some of his experiments, arrived at a very different conclusion from the above inquirers, for they found that the solid residue of arterial blood exceeded that of the venous. Letellier, however, is probably nearer the truth when, as the result of his observations, he states that there is no fixed rule on the subject.

The author then attempts to estimate the real differences existing between arterial and venous blood, by showing what the arterial blood has to supply which the venous has not, what greater wastes the one is subjected to than the other, what compensating additions derived from the nutriment the one receives which the other does not. After all, however, he shows that the differences are extremely slight, amounting only to fractions of hundredth parts, and are so dependent on the mode in which the liver, kidneys, skin, and lungs discharge their functions, that the slightest irregularity in them causes the excess of principles to be found in the one case in the venous, in the other in the arterial blood.

But though the general arterial and venous blood differ so slightly, the author endeavours to demonstrate that there are decided differences between the blood of the renal arteries and that of the renal veins, and between the blood of the hepatic veins and that of the *vena portæ*. According to his own analysis the blood of the *vena portæ* differs from arterial blood solely in containing less fibrin, but more fat, hæmatin, and extractive matters. But sometimes the blood of the *vena portæ* contained most solid residue, sometimes that of the arteries; sometimes the one contained most albumen, sometimes the other. The blood of the *vena portæ*, however, differs in several physical characters from both arterial and venous blood. It is darker coloured, coagulates more slowly, the clot is less firm, and has more of a gelatinous appearance. When allowed to stand a delicate glittering film forms on the surface of the serum, which is seen under the microscope to consist of fat globules.

The blood of the hepatic vein, on the other hand, is still darker than that of the *vena portæ;* the fibrin is removed from it with greater difficulty by stirring with a rod, and, even after this is effected, the blood still possesses the tendency to gelatinize, and actually forms a loose gelatinous clot from which the serum separates. From his analysis of this blood the author concludes that the blood of the hepatic vein is richer in solid constituents than either arterial or ordinary venous blood, or that of the *vena portæ*, but contains less fat, fibrin, globulin, and colouring matter than the last of these.

In showing the important light which these analyses throw on the physiology of the biliary secretion, the author directs attention to the fact, that the blood of the hepatic vein contains only 4·8 per cent. of colouring matter, of which 3·9 were hæmatin and 0·9 hæmaphæin, whilst that of the *vena portæ* contains 5·4 of colouring matter, of which 4·2 were hæmatin and 1·2 hæmaphæin. From this fact he deduces the conclusion that the colouring matter of the bile must be formed from the colouring matter of the blood, seeing that in its passage through the liver it has suffered the loss of a portion of that constituent. The author accounts for the large proportion of albumen in the blood of the hepatic vein on the same hypothesis, viz. the decomposition of blood globules, for he holds that, were the bile furnished by the plasma, the albumen would be diminished, whereas, were it produced by decomposition of blood globules, part of these would be resolved into albumen, and thus increase the proportion of that ingredient. He appears to forget that, according to his own theory, the decomposition of these bodies give rise to fibrin likewise—a constituent which is almost wanting in the blood of the hepatic vein.

The blood of the renal veins was found to be much darker in colour than aortic blood, but no fibrin could be obtained from it by stirring it with a rod. It, however, became gelatinous on standing. On examining this blood by the microscope, the individual corpuscles could not be traced, as they united into amorphous groups. On analysis it was found to contain less water than arterial blood, but more solid residue and more albumen. The quantity of fibrin was too small to be ascertained. The author hence deduces the conclusion, that the urea and uric acid of the urine, and excess of albumen in the blood of the renal veins are formed from the decomposition of the blood corpuscles of arterial blood within the tissue of the kidney.

The author sums up his views of the modifications and changes that the blood undergoes in the course of the circulation, in the following words.

> "The first and principal object of the blood is the nutrition of the organism, and for this purpose the circulating fluid is modified and consumed in the peripheral system. We have conjectured that the extractive matters of the blood which are removed by the kidneys are thus formed. The constant modification and consumption of blood dependent on the act of nutrition render the supply of fresh nutrient fluid, and the removal of effete matter, indispensably necessary, since a proper constitution of the blood is requisite for the

due performance of the function of nutrition. The effete matters are replaced by chyle mixed with lymph; and this fluid must of necessity be converted into blood, as otherwise the blood would soon consist entirely of chyle. The change is effected by the formation of young blood corpuscles (an act which is accompanied by the consumption of chyle, lymph, and oil corpuscles), and by the fibrin of the chyle becoming more plastic; all the other fluid constituents of the chyle are similar to those of the *liquor sanguinis*, except that there is an excess of water and of extractive matters in the former. If, therefore, we suppose a continuous formation of blood-corpuscles, the necessity for their consumption must be sufficiently obvious. I have assumed that fibrin is formed as a consequence of this consumption, and that this newly formed fibrin supplies the place of that which is employed for the purpose of nutrition in the peripheral vascular system. I have also shown that there is no difficulty in the idea of the formation of albumen; and lastly, I attempted to show, that in all probability urea, uric acid, and bilin are formed as a consequence of this consumption of the blood corpuscles. For these substances must necessarily be formed as products of the changes which the constituents of the blood undergo in the circulation, and are not (as observations on starved and emaciated individuals show us) a consequence of the changes which the circulating fluid undergoes during the nutrition of the tissues, but are dependent on the metamorphic action that is produced by the respiratory process. It is principally the blood-corpuscles, (as I have endeavoured to show,) that are connected with the consumption of oxygen; and when we reflect that this change in the corpuscles must take place under similar conditions in animals, both high and low in the scale of development, we can understand how it is that urea, uric acid, and bilin occur in the renal and hepatic secretions of animals of nearly every form of structure, and under such varying phases of existence."—P. 220.

For the purpose of ascertaining the effect of age, sex, and temperament on the constitution of the blood, Dr Simon only analysed the blood of a healthy male and of a healthy female; but he quotes very liberally from the researches of Denis, Lecanu, Nasse, Becquerel and Rodier, Andral and Gavarret, &c. From these it appears that, generally speaking, the blood of females contains more water and albumen but fewer blood corpuscles than that of males. That the blood of lymphatic persons is poorer in solid constituents, and more especially in blood corpuscles, than those of sanguineous temperament. That fœtal blood contains much less water and a much larger proportion of blood corpuscles than that of the mother. That soon after birth the blood attains a minimum of solid ingredients, but particularly of blood corpuscles. That the solid ingredients, and especially the blood corpuscles, increase in proportion with age, till from the thirtieth to the fiftieth year, during which period of life they are at their maximum, after which they decrease as age advances.

The analysis of diseased blood is next commented on, and after pointing out the mode which he considers the most accurate, the author shows the imperfections of the modes of other experimentalists by giving analysis of the same blood according to their modes and according to his.

The first topic noticed is the effect of blood-letting on the composition of the blood; and from the analysis made it appears that the proportion of blood globules decrease on each venesection, while that of the fibrin increases. Thus in Andral and Gavarret's experiments, in which blood was drawn four times successively from the same individual, the fibrin which was at the first venesection 4·0 in the 1000 parts of blood, rose on the second venesection to 5·5, on the third to 6·5, and on the fourth to 9·0; while the blood corpuscles, which at the first venesection were in the proportion of 111 in the 1000 parts of blood, fell on the second venesection to 107, on the third to 101, and on the fourth venesection to 83.

Hyperinosis, or that state of the blood in which the fibrin is increased, includes all those diseases usually termed inflammatory. As their general character, it may be remarked that in all the proportion of fibrin and of fat is increased, that of the blood corpuscles and of the whole solid residue diminished. It seems unnecessary to do more than instance the different diseases in which the author, or those whom he quotes, had opportunities of examining the blood and ascertaining this fact. These were metrophlebitis puerperalis, phlegmasia alba dolens, carditis, bronchitis, pneumonia, pleuritis, angina tonsillaris, hepatitis, peritonitis, (under which the translator and editor quotes from Heller a case in which milky serum furnished no less than 50 per 1000 parts of fat,) nephritis and cystitis, acute rheumatism, erysipelas, phthisis tuberculosa, puerperal fever, puerperal convulsions, and carcinoma, (in which the fibrin had increased to the enormous proportion of 16·44 in 1000 parts of blood.)

In commenting on the probable cause of the peculiar change in the composition of the blood in inflammatory diseases, it is remarked that, though numerous observations have shown that blood retained for any length of time in an organ, and thus prevented from meeting with a due supply of oxygen, becomes poorer instead of richer in fibrin, the above facts prove that in inflammation the blood becomes richer in that principle. Blood impeded in the course of its circulation usually becomes darker coloured, but blood from an inflamed spot is generally brighter coloured than usual. The solid constituents of inflamed blood are certainly diminished, but the fibrin is increased. Provided, therefore, we can assume that there is stagnation of blood in the affected organ during an inflammatory attack, we cannot doubt that its composition differs from that of the blood of the rest of the body. Whether the blood is the first part of the system diseased, or whether it becomes modified in consequence of the pathological condition of the suffering organ, is a question not easily answered. During inflammation, however, the functions of all the organs essential to the well-being of the blood are disturbed; the temperature is heightened; the pulse is full, hard, and frequent; the urine scanty and loaded. The vital activity of the blood is thus heightened, and its metamorphosis hastened by the increased rapidity of circulation. It remains, therefore, to inquire whether an accelerated metamorphosis would explain the condition of the blood as observed in inflammation. The blood corpuscles taking an essential part in the respiratory process, and their vital activity, evolution, and decomposition, being only carried on by the co-operative agency of the atmospheric oxygen, in proportion as the circulation is increased, the author supposes that the decomposition of the corpuscles will be increased. By this theory the nuclei of the corpuscles become fibrin, and their increased decomposition of course increases the quantity of this constituent of the blood. As the corpuscles are consumed more rapidly than they can be supplied by the development of new corpuscles from the chyle, these bodies are found diminished in proportion as the fibrin is increased. Excess of fibrin in the blood has been suggested to be one of the causes at least of increased energy of the heart's action. If, therefore, says the author, we can only assume that the circulation is increased by the reaction of the organism in inflammatory affections, an explanation is at once afforded us of the change that occurs in the composition of the blood in hyperinosis, and at the same time of its heightened temperature. He allows, however, that the nerves may exert some influence; but he does not endeavour to explain how venesection acts, which produces the very same effects as the inflammatory state of the system.

The second form of diseased blood, hypinosis, is the very opposite of hyperinosis, and may be characterized as consisting in an increased proportion of blood corpuscles, and a proportionally diminished proportion of fibrin. The distinctive characters of the blood in this class have been much overlooked, seeing that the diseases included under it seldom require depletion. The quantity of fibrin is generally less than in healthy blood; but if it amounts to the normal quantity, its proportion to the blood corpuscles is less than is found in a state of health. The quantity of corpuscles is either absolutely increased, or their proportion to the fibrin is so, and the solids of the blood are hence usually greater than natural. The blood when drawn generally forms a large, soft, diffluent, dark-coloured clot; occasionally no clot is formed. The buffy coat is seldom seen, or, when it does occur, it forms a thin, soft, gelatinous, parti-coloured deposit on the clot.

The serum is often deep yellow from bile, or red from suspended blood corpuscles. The blood has always an alkaline reaction.

Typhoid fever, especially that form going on to ulcerations of the intestinal follicles, is especially characterized by this form of blood. If, however, inflammatory symptoms occur, or the fever assumes the synochal type, the blood increases its fibrin and diminishes its blood globules. If, again, the fever assumes the putrid or low typhoid type, the quantity of blood corpuscles and of solid constituents decreases so remarkably, that the blood then assumes that form which the author terms spanæmia. From the analysis of the blood in abdominal typhus given by the author, it appears that the fibrin decreases, and the proportion of blood corpuscles increases as the disease advances; but the moment the first symptoms of amendment take place, the fibrin begins to increase and the blood corpuscles to diminish. The blood in continued fever presented the same peculiarities. The author is inclined to include almost all the exanthemata in this class, as, generally speaking, the blood in them possesses the deficient proportion of fibrin and the increased proportion of blood corpuscles. In many cases in which the fever ran high, the blood contained the normal proportion of fibrin, and, in a very few, the fibrin was seen above the standard; still, the general characters of the blood in variola, varioloid, rubeola, and scarlatina, was such as to justify their being classed under this head. The blood in intermittent fever and in cerebral apoplexy was found to present the same peculiarities.

Although Dr Simon has not shown the practical application of these researches to the cure of disease, we may direct attention to the subject, as these researches are of the utmost importance to the practical physician. It has long been a question, yet unsettled, whether blood-letting ought ever to be employed in typhus, continued, or intermittent fevers, or in the exanthemata. Blood-letting is much less frequently employed now-a-days than it used to be in these complaints, and its use at all has been more than once questioned. These researches show that, generally speaking, depletion ought not to be had recourse to, as the natural course of the disease is toward what the author describes as the third class of diseased blood, in which there is a deficiency of all the solids. and, do what we will, these diseases will run their course after being once developed. Besides, these same researches prove that where blood-letting was employed a second time, the blood was found to contain a much less proportion of solids than at its first examination. The blood-letting, in fact, had hastened the tendency to the low typhoid or putrid stage. Unless, therefore, decided inflammatory symptoms are present, or some internal vital organ be threatened, blood-letting should not be employed in those diseases in which this form of blood occurs.

The third form of diseased blood the author terms Spanæmia, or poverty of blood. The blood is deficient in solid constituents, especially in fibrin and blood corpuscles; the salts of the serum are sometimes normal in quantity, sometimes diminished. The blood is very fluid, is of a dark or even violet colour, but is occasionally bright. It generally coagulates imperfectly, sometimes not at all. The clot is small, soft, diffluent, and neither covered with a true nor false buffy coat. The serum is generally of a bright yellow colour, but sometimes is dark yellow or red coloured. The diseases in which the blood possesses the above characters are anæmia and hydæmia, carcinoma, chlorosis, scorbutus, land scurvy, different kinds of hæmorrhage, *purpura hæmorrhagica*, *typhus petechialis*, yellow fever, and plague. It is remarked that in many of these diseases the blood exhales a heavy peculiar odour, which the author thinks is owing to the presence of ammonia in the blood, as the addition of an alkali causes the evolution of that gas. A few interesting analyses are quoted for the purpose of showing that the fibrin is in some cases positively increased though the other solid ingredients are much diminished in quantity, and this, too, in cases where the blood was so fluid or putrid as to escape from the gums, &c. Under chlorosis, too, are quoted experiments to show that, under the administration of iron, the proportion of solids increased, but especially that of the blood corpuscles, while the fibrin absolutely diminished.

The therapeutic indication in all those diseases which are characterised by having the blood in an impoverished state, is to avoid blood-letting or other antiphlogistic means, and to support and strengthen the system.

Under the fourth form of diseased blood, which the author terms Heterochymeusis, is arranged all those diseases in which a substance is present in the blood which does not exist in the natural state. Under this class ought properly to have been arranged the putrid form of typhus, yellow fever, and plague; but the author very justly remarks, that as the presence of ammonia in the blood was not a constant symptom in these diseases, and as the deficiency in the solid constituents was the most obvious character, it was more consonant with a natural arrangement to place them under the third class.

Uræmia, or blood containing urea, constitutes his first genus. Under this head is classed Bright's disease of the kidney and cholera. It is not so generally known that urea has been detected in the blood in cholera, but it would appear that every one who has examined the blood in that disease has found it in considerable abundance. It has been found by Rainy, O'Shaughnessy, Marchand, Heller, and the author Dr Simon. We are not quite sure how far the author is correct in placing cholera under this head, any more than it would be correct to place the peculiar fever which prevailed in this country last year, in which urea was found present in the fluid effused in the ventricles, or, in fact, any other disease in which such a symptom occurs as a natural consequence of the suppression of the secretion from the kidneys.

Melitæmia, or the existence of sugar in the blood, forms the second genus. Diabetes is the only disease classed under this head. The author confirms the observations of Bouchardat, that the sugar is only found in the blood when blood is abstracted two or three hours after dinner, whereas if the blood be drawn in the morning no trace of it can be detected.

Cholæmia, or the existence of bile in the blood, is the next genus. In the author's analysis of icteric blood the albumen, colouring matters, extractive matters, and salts were greatly increased, while the fibrin was diminished. The fatty principles were normal. In Denis' analysis the fat and fibrin were both remarkably increased, the albumen natural. While in Becquerel and Rodier's analysis the fibrin was deficient, but the fatty matters were in double their usual proportion.

Piarhæmia, or the existence of a morbid quantity of fat in the blood, forms the fourth genus. In healthy blood the fat exists in a saponified state, but in this disease the globules of fat float free, and give to the serum a milky appearance. Fat in the blood has been seen in diabetes, hepatitis, pneumonia, dropsy, icterus, nephritis, mammary abscess, &c. and varies from 10 to 117 parts in the 1000 of blood.

Pyohæmia, or the existence of pus in the blood, has been recognised by Mr Gulliver in all diseases in which there is suppuration accompanied with hectic fever. Its existence has been also recognized by Blandin, Donné, Gluge, Simon, and others. The microscope most easily detects this form of diseased blood; but the inexperienced are very apt to mistake chyle corpuscles for those of pus.

Animalculæ have also been detected by Dr Chiaje, Dr Goodfellow, Mr Bushnan, and others, in the blood of persons labouring under different diseases; and they have been frequently detected in the blood of the lower animals.

In an appendix to this part of the volume is added numerous valuable additional analyses of the blood during pregnancy, menstrual blood, and the blood of the lower animals.

The editor and translator, Dr Day, deserves the highest praise for the mode in which he has discharged his duty to this part of the work. To almost every section he has added most valuable notes, detailing the researches of others whose works had not been known to the author, or which had been published since his lamented death. These increase greatly the value of the whole work,—in fact, render the portion treating of the blood almost a complete monograph of all the late and valuable experiments and researches on that interesting compound vital fluid.

In the few remarks which are given on the lymph nothing is added by the author. The analysis and observations, however, of Muller, Marchand, Colberg, Gmelin, Rees, Lassaigne, L'Heritier, and Nasse are quoted, from which it appears that lymph must be regarded as dilute serum.

The chyle obtained from the thoracic duct of the horse has been several times analysed by the author, but the results were so various that no general conclusions could be drawn from them as to its composition. It would appear from his analyses that he had killed his animals too soon after their meal, as his first analysis gave only 1 per 1000 parts of fat, his third 3 per 1000, and his second 10 per 1000. Whereas, Dr Rees obtained 36, Nasse, 32 per 1000; and Tiedmann and Gmelin found its proportion to vary according to the kind of food taken. The chyle contained much the same solid and colouring matters as the blood, but in lesser proportion. The salts existed in much the same proportion. According to the author's analysis the solid constituents of the chyle ranged from 59 to 84 per 1000 parts; the fibrin never amounted to 1 per 1000; the hæmatoglobulin varied from a trace to 5·6 per 1000; the albumen with the lymph and chyle corpuscles from 42 to 60 per 1000. The chyle was alkaline, and one specimen contained a considerable number of blood corpuscles besides the lymph and chyle corpuscles.

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## ART. V.—*A Practical Treatise on the Special Diseases of the Skin, enriched with Cases and numerous Notes collected from the best Authors, and in the Cliniques at the Hospital Saint Louis.* By C. M. GIBERT, Physician to the Hospital Saint Louis, &c. Second edition, corrected and considerably enlarged. Translated from the French by EDGAR SHEPPARD, Member of the Royal College of Surgeons of England. 12mo. London, 1845. Pp. 362.

IT is not possible to imagine a higher compliment paid to any method of arrangement, or a more unequivocal admission of its merits than what has taken place within the last twenty years in France, as to the arrangement of cutaneous diseases by Dr Willan. Several works of great merit, and on different scales of magnitude have appeared on that subject by French practitioners; yet, whatever improvements they have introduced, whatever deviations they have made, in whatever way they have expanded the system, in all we recognize Willan's as the fundamental scheme, and in all we see evidence that they have been unable to discard the principles of classification which he established.

Such is indeed what we observe in the large and elaborate work of Rayer; such we observe in the lectures of M. Biett, as published by Cazenave and Schedel; and such, we must add, is the case with the work now before us, proceeding from M. Gibert.

One of the most distinguished physicians of the great Hospital of Saint Louis, most successful in his treatment of cutaneous diseases, and followed by crowds of students eager to derive instruction from his clinical lectures, it was very natural for him to supply to these students a manual embodying his views on the nature and causes of these diseases, and the modes of practice he found most successful in their cure. On such a well cultivated field it was scarcely to be expected that new views of disease, or many new modes of treatment could be promulgated; and if the author, in detailing the modes of treatment, and views of others, confirm them by his own experience, it is almost all we can desire. The work, nevertheless, exhibits great research, full knowledge of the opinions of the ancient and modern writers on the subject, an accurate discrimination of the various complicated forms of cutaneous affections, and much sound judgment in the investigation of their causes and modes of treatment. In another respect, also, it deserves praise, inasmuch as it is so rare to see it in French works; and that is, that the author shows considerable acquaintance with English writers, and does not fail to give them in many instances the credit due to them.

As the title imports, M. Gibert's treatise is on the Special Diseases of the Skin, not including, as most other treatises do, those febrile diseases accompanied with efflorescence, rash, or pustules, such as scarlet fever, measles, and small-pox. The omission of these seems to be judicious, as in a strict nosological arrangement they must be classed along with fevers, and in practice be treated as such. Willan's arrangement, modified after that of Biett, is adopted as the best yet devised for the classification of skin diseases. These he divides into eight orders,

1. *Exanthemata*, including Urticaria, Roseola, and Erythema.
2. *Bullæ*, including Pemphigus and Rupia.
3. *Vesiculæ*, including Scabies, Herpes, and Eczema.
4. *Pustulæ*, including Ecthyma, Acne, Impetigo, and Tinea.
5. *Papulæ*, including Prurigo and Lichen.
6. *Squamæ*, including Ichthyosis, Pityriasis, and Lepra.
7. *Tubercula*, including Lupus, Elephantiasis Græcorum, E. Arabica, and Cheloidea.
8. *Maculæ*, including Ephelides, Nævus, and Purpura.

To each of these different orders, however, the author also adds a species of that proteiform disease syphilis. Thus he has the exanthematous syphilide, bullous, vesicular, pustular, papular, squamous, tubercular, and macular syphilides.

Much valuable information is contained in M. Gibert's general considerations. After a short historical notice of the writers on skin diseases, he proceeds to notice the proximate causes of this class of maladies. Little light has been thrown on the subject by the different theories which have been held as to skin diseases being produced by alterations of the bile, blood, &c., or by the existence of an inflammatory state of the system, &c. It is safest to confine ourselves to the immediate result of observation which has demonstrated that such maladies are frequently dependent on a special diathesis, which has caused, sustained, and reproduced them. The difficulty is to distinguish between the cases which are purely local, and those which are kept up by causes more or less general.

"It is evident, for example," says M. Gibert, "that certain *erythemata* of children and fat subjects, the *itch, herpes labialis,* under many circumstances, and *zona* itself, constitute merely local diseases, and merely require local treatment, although some of these affections do occasionally manifest themselves as the crisis, or the consequence, of a generally disordered state. On the other hand, the *eczema*, the *impetigo*, and the *pseudo-tineæ* of infants at the breast, or during dentition, appear to be purifying or counteracting maladies, dependant upon certain general conditions which ought to be taken into consideration. Plethora, either general or local, a gritty and roughened state of the *primæ viæ,* nervous and circulatory fluxions, dependant on the revolutions of age, and many other circumstances well known to the practitioner, give rise to the *exanthemata,* to *acne* or acne *rosacea*, and to various species of cutaneous affections, the cause of which is elsewhere than in the seat of the apparent evil. Lymphatic debility is favourable to the development of *favus,* or the true tinea ; the scrofulous diathesis often produces *lupus* or *herpes exedens ;* the syphilitic virus regulates and has under its dependance special forms of cutaneous disease. It is very evident, then, that the local ought never to be considered independently of the general state, in the study of this branch of pathology."—P. 14.

The occasional causes of cutaneous diseases are considered under several heads.

1. *Hereditary causes.*—The principal dartrous affections appear in many cases to be transmissible by generation from parent to child, or rather the constitutional peculiarity favourable to the production of cutaneous disease. M. Gibert has observed the same of ichthyosis, lepra, impetigo, eczema, and lupus.

2. *Contagious causes.*—The itch is a truly contagious malady, perhaps also tinea ; but there is no distinct proof that the dartrous affections are capable of being so communicated. Where they, or the saffron-coloured spots of *pityriasis versicolor*, or the squamous excoriations of eczema appear nearly simultaneously in one family, the cause may generally be traced to an analogy in their mode of life, habits, regimen, constitution, and temperament, without necessitating us to attribute it to contagion.

3. *Anatomical and Physiological causes.*—It is in the organization of the skin itself we are especially to look for the conditions which favour the development of cutaneous diseases. A fine delicate skin abundantly supplied with blood is the one most frequently attacked. The opposite condition, however, a thick rough, oily skin, performing its functions indifferently, as is observed in bilious subjects, is disposed to papular and other eruptions. Particular diseases appear even to be peculiar to certain temperaments. Thus lymphatic and lymphatico-sanguineous persons are principally subject to furfuraceous and scaly eruptions; sanguineous and sanguino-lymphatic persons are more frequently tainted with impetiginous maladies; while bilious and melancholic subjects are more particularly liable to pustular and squamous affections. Age has also a marked influence in the production of diseases of the skin; certain diseases of the integuments of the head and face being nearly exclusively confined to infancy. A pustular eruption on the forehead is very common at the period of puberty; and old people, the functions of whose skin are generally ill performed, are subject to the scaly tetter, prurigo, and other chronic cutaneous affections.

4. *Hygienic causes.*—Hot climates and the spring and summer seasons favour the production of skin diseases. The want of cleanliness and the application of irritant substances to the skin, often from the particular trade followed, are very common causes of cutaneous affections among the lower orders. Particular articles of food, too, frequently produce an eruption of some kind. Thus, spirituous liquors often occasion *acne rosacea* and *sycosis menti*; certain fish produce exanthematous efflorescences; and all have recognized the influence of preserved fish and smoked provisions in inducing various cutaneous eruptions. Even mental emotions have caused the sudden appearance of certain cutaneous diseases; and it is recorded on the authority of Joseph Frank that eunuchs enjoy a singular freedom from all such affections.

5. *Pathological causes.*—Scrofula and syphilis are frequent sources of skin disease. The same has been asserted of gout, rheumatism, and scorbutic cachexia; and even one form of cutaneous affection frequently leads on to another. It seems, however, to have been too much overlooked by late inquirers that the state of the internal organs is intimately connected with the development of cutaneous diseases, and hence the danger of suddenly suppressing the one without attending at the same time to the state of the other.

A few remarks are made on the metastasis and crisis of cutaneous affection. It is shown that, when suddenly suppressed, they occasionally produce metal alienation, epilepsy, various internal inflammations, hæmoptysis, &c. Of themselves cutaneous diseases do not often terminate fatally; but are frequently very intractable, sometimes even impossible to cure.

The general treatment of cutaneous diseases consists of three divisions,—1. Hygienic means; 2. General or constitutional remedies; and 3. Topical applications. The influence of hygienic means is seen every day in the class of patients admitted into the hospitals; the cleanliness, regular life, and change of habits which they are forced to undergo, suffice alone to produce a cure in many affections. Moderate exercise, free action of the skin, and a pure warm atmosphere are not less essential than attention to cleanliness and diet. The older physicians were accustomed to begin the treatment of every cutaneous disease by a preparatory general treatment, including blood-letting, purging, sweating and purifying the supposed acrid state of the fluids by vegetable drinks of dulcamara, buckbean, lactuca, gentian, sarsaparilla, hellebore, aconite, colchicum, aloes, or some other drug; or by some mineral waters, especially the sulphureous, alkaline, and chalybeate. Marvellous cures were also reported to have been effected by means of viper broth, and other animal preparations. Under the external topical remedies are classed general blood-letting and leeching. Local applications, as irritants, fomentations, plasters, blisters, &c. and baths. The author's comments on each of the classes of remedies above enumerated are so valuable that we give them in detail.

"1st. *Antiphlogistics.* Blood-letting, (either general or local), diluent and slightly laxative drinks, tepid baths, topical emollients, a diet more or less rigid, or, at least, a soothing regimen, are proper, particularly at the commencement of the treatment, in subjects who have a certain degree of vigour in their constitution; in the cutaneous affections which are ushered in with symptoms of irritation; in those the duration of which is not very long. In fact, the greatest number of skin diseases present, as other maladies, periods of invasion, of increase, of stand still, of decline or chronicity, the characters and duration of which are more or less modified by the rapidity or slowness of their march; and we perceive that the therapeutic remedies ought to vary in these different phases.

"Nevertheless, we must mention, beforehand, that whilst twenty years ago, *specific* methods were abused, the sulphureous and other excitants in usage being applied off-hand and indiscriminately to everything which bore the name of *dartre;* in the present day, on the contrary, prepossessed with the modern idea, which tends to attribute to inflammation every shade of alteration which the tissues, and the skin amongst them, can present, we insist more and more frequently upon antiphlogistics, and particularly upon topical emollients, which, in many cases, have merely the effect of prolonging the evil, by favouring the fluxion and morbid exhalation which may be noticed in the integuments in most dartrous diseases.

"2d. *Astringents.* Astringents and discutients, very frequently employed by the Greeks of the second order, and Arabians, undoubtedly require considerable caution in their application, but they frequently offer the most indisputable advantages over antiphlogistics, in the treatment of cutaneous affections. For example, it is not uncommon to see pruriginous, vesicular, and humid eruptions suppressed at their very commencement, without any danger or inconvenience, by applications of *burnt meal*, *extract of lead*, ointments with *white lead*, or even by ice, cold water, red wine, &c. How often has *eczema* (*dartres squameuses humides*), which continues to spread and extend itself under the influence of emollients, been rapidly cured by tonics, astringents, and discutients. However, they are generally only recommended at rather an advanced period in the treatment. M. Bland, of Beaucaire, has recently called the attention of practitioners to the advantages of *soot* in the treatment of dartrous affections, particularly favus, lupus, and acne rosacea. (Vide the memoir of this author, inserted in tom. ii. 1834, of the *Revue Méd.*)

"3d. *Narcotics.* Soothing and narcotic remedies, such as *henbane, belladonna*, the preparations of *opium*, &c., are sometimes resorted to, either externally or internally, in those cutaneous diseases which are accompanied by violent and insupportable itching; but these means, in general, are only palliative, and the dangers which they may give rise to, either by their direct effect upon the economy, or by the reflexion or driving inwards of the malady, ought to render the practitioner extremely cautious in their employment.

"4th. *Venomous and poisonous* substances. Certain poisonous or acrimonious vegetables, as the *hemlock*, the *Lactuca virosa*, the *aconite*, the *Rhus radicans*, &c., have sometimes marked effects in the treatment of dartrous affections, but they are rarely administered except in those of an inveterate and intractable nature. The same may be said of the mineral and animal *caustics*, such as the *mercurial* and *arsenical* preparations, *cantharides*, &c., the external, and particularly the internal, exhibition of which requires to be watched with the greatest care. Caustic applications, such as *the nitrates of silver and mercury*, are frequently employed, in the present day, for the dispersion of dartrous maladies, even to the entire neglect of all internal remedies. This does not appear to us a very rational method, and we think that these energetic agents ought to be reserved for three principal circumstances: 1st, when a cutaneous, and particularly a contagious, disease, such as the itch, is at its commencement, and we can hope by this means to arrest it in its birth; 2d, when an inveterate cutaneous disease has been already combated by internal and external means of a different kind, and we have no reason to fear the effects of the suppression of the local evil upon the economy, nor the continuance of the general morbid disposition which has already produced it, and will produce it again; 3d, when it becomes necessary to arrest the progress of *dartre rongeante* or lupus.

"5th. *Issues.* In the last century very frequent use was made of issues, in diseases of the skin, to give vent to the altered fluids, to which the production of each malady was attributed. In the present day, on the contrary, some distinguished practitioners entirely prohibit them not only as useless, but dangerous, inasmuch as they tend to keep up in the integuments a state of fluxion and irritation peculiarly favourable to the return or the development of the cutaneous affections, at least in the neighbourhood where the issue has been applied. In some cases, however, it has appeared proper to us to apply a cautery or a blister towards the conclusion of the treatment, where the cutaneous malady has been accompanied by a humoral secretion, more or less copious, particularly if any internal organ appeared disposed to become affected. Without this precaution it would seem dangerous to suppress some affections of the scalp in young people, and certain dartrous eruptions in subjects disposed to pulmonary diseases. It is particularly in cases where the arrest of the cutaneous malady has been followed by symptoms of internal mischief that *revulsives, issues, vapour and sulphureous baths, sinapisms, and blisters,* are useful, and efficaciously tend to bring back the suppressed disease, or, at least, to combat the internal derangement which has ensued, by a powerful revulsion.

"6th. *Tonics.* Tonics and bitters are frequently very appropriate in lymphatic and scrofulous subjects, and in all cutaneous affections which are accompanied by a more or less marked feebleness of the lymphatic system. *Hops, gentian, violaria,* and *lapathum,* are the remedies commonly used, particularly in the third period of the disease. With these drinks we frequently combine the *alkaline subcarbonates ;* we sometimes even employ the *muriates of lime* or *barytes,* in small doses ; but the two last require much caution in their exhibition, and ought only to be given in scrofulous cases.

"7th. *Purgatives.* We have already said that the ancients very frequently employed purgatives in the treatment of skin diseases. They are still used in the present day as evacuants and derivatives ; *scammony, jalap, calomel,* and the neutral salts are most resorted to, and they are administered, at intervals more or less distant, in a great number of chronic cutaneous affections, which are usually accompanied by constipation. Some physicians, who confine themselves exclusively to this therapeutic method, pride themselves on obtaining nearly constant success. There is no necessity for observing that before we commence we ought most carefully to observe the state of the digestive apparatus.

"8th. *Sudorifics.* The *alkaline, sulphureous,* and *vapour* baths are frequently employed to render the skin soft and pliant, to cleanse it from the squamæ and crusts which cover it, to re-establish its functions, always more or less altered in its chronic affections. Sudorific drinks, such as *sarsaparilla, guaiacum, Daphne mezereum,* to which we can add various antimonial preparations, are also employed, and particularly in those of an inveterate *syphilitic* nature.

"9th. *Revulsives.* When by the effects of age, regimen, or some other circumstances, certain parts of the body become the seat of a congestion which involves something morbid, we often succeed in curing the cutaneous disease which shows itself, by seeking to determine towards other parts, the elements of the fluid which have given rise to it. It is in this way that the exercise of the inferior extremities (the appropriate means to provoke the catamenial discharge), and marriage, give rise to the cure of dartrous eruptions on the ears or the face of young females who are seldom regular, and in whom the countenance is habitually coloured. It is also by a revulsive effect that purgatives and blisters frequently act.

"10th. *Specifics.* Without attempting to exaggerate, and still less to explain, the action of *specific* or special remedies, we will premise our readers, that we would simply designate under this name certain drugs which appear generally appropriated to the treatment of a large number of skin diseases, and we do not pretend that they ought always to be employed in preference to every other medication. In this order we comprise certain vegetable and mineral substances, which experience has proved to possess a special efficaciousness in the treatment of dartrous eruptions.

"The *juices of herbs*, the buckbean, the scandix cerefolium, the sisymbrium nasturtium, the dulcamara, and others, are in daily and common use; but we must choose from among these plants and exhibit them according to their properties, at diverse periods, and in various cases. Thus those which are diluent and cooling are particularly appropriate at the commencement, during the period of increase, and in subjects who present any signs of plethora, or sanguineous irritation. Those which are stimulating and exciting are proper during the period of decline, and in cases where there is no indication of vascular disturbance.

"*Sulphur*, employed from the most remote antiquity, and which appears endowed with an action quite specific, in chronic cutaneous maladies, ought not to be indiscriminately applied, either externally or internally; it is not at first suitable, except in some affections which recognise an external cause, as *the itch*, and in some cases of circumscribed dartrous eruption. Its action is commonly excitant, particularly when it is employed as a sulphuret or as sulphurous acid. Generally speaking, the preparations of sulphur are not suitable in the periods of invasion and increase, nor in vascular and plethoric subjects, and they ought, in many cases, to be preceded by blood-letting, warm baths, and purgatives.

"*Simple* baths, on the contrary, are useful at all periods of skin diseases. Those of *vapour* cause the falling off of the squamæ and crusts, effect the softening of the skin, and give rise to a particular kind of temporary inflammation, accompanied and followed by an expansion and desquamation, the effects of which are most salutary. These baths are employed with advantage in scaly and crustaceous affections, and in many skin diseases, at the period of decline. The *vapour douches* are resorted to in nearly the same cases, and particularly when the affection is confined to certain parts. The *alkaline* and *sulphureous* baths generally act as excitants, and are only suitable when the march of the disease is chronic, presenting none of the phenomena of vascular irritation; they are often preceded by the simple and vapour baths. The *sulphureous fumigations,* still more irritating, are employed in nearly the same cases as the sulphureous baths. The *mercurial* fumigations, commonly made with *cinnabar,* are administered in cases of inveterate and circumscribed syphilis. The *aqueous* and *sulphureous douches* also act as excitants. The waters of *Barèges, Cauterets,* and *Enghien* are employed internally, under nearly the same circumstances as the sulphureous baths. Although the mineral waters, as they exist in nature, are generally far preferable to the factitious ones, particularly when they are exhibited in the place from whence they are procured, nevertheless, they (the artificial ones) are frequently employed with success, especially externally.

"In order to render more precise the general rules which we have laid down, we will take a particular example, and will mention the order to be observed in a methodical and rigorous treatment.

"Supposing a patient, with a very strong and vigorous constitution, to be affected with an *impetigo:* we should commence by prescribing a preparatory treatment, (low diet, bleeding, baths, diluents, purgatives.) Afterwards, in the course of the first period, relaxing drinks, an abstemious and regular regimen, and, occasionally, a warm bath; still later, bitter and purifying drinks, and vapour baths; lastly, sulphur baths, preparations of sulphur externally and internally, topical astringents, corrosives, and even caustics, a blister, too, if the eruption were intractable and circumscribed, (the crusts being previously detached by emollient applications.) In following this course, we effect a slow, it is true, but a certain cure, with but little probability of a relapse,

"It is here that we are reminded of the old adage, so full of useful application, either in medicine or surgery,

"Sat citò si sat benè."—Pp. 36–41.

To the particular treatment applicable to each variety of cutaneous affection we must refer to the work itself, which commends itself to the notice of every practitioner, in not only describing with sufficient minuteness the varieties of these disorders, but the different kinds of treatment which, in M. Gibert's own hands, or those of others, have been found most successful in their removal. Of these it would be useless to attempt any analysis; but we would more especially direct the attention of the profession in this country to the remarks on the syphilitic diseases of the skin, which are very valuable.

The loathsome disease long known by the name of lepra, M. Gibert, following Bateman, arranges under the order Tubercula, applying to it the term *Elephantiasis Græcorum.* It was for this disease the different leper hospitals, so common at one time in different parts of Europe, were erected. In mentioning purpura, he endeavours to show that from the success of two opposite modes of treatment in even the milder cases, it must be caused by two opposite states of the system, that, in fact, there must exist a sthenic and asthenic purpura; the first being easily cured by blood-letting and depletive treatment, the latter being aggravated by this, but rapidly yielding to tonics and generous diet. He confesses, however, his inability to distinguish the line of treatment applicable to numerous cases; a circumstance which we attribute to his neglect of the state of the pulse as to strength. In our own practice we have found no difficulty in deciding the question. Whenever the pulse is compressible, no matter how quick or tense, tonics and generous diet are indispensable to effect a cure. If the pulse again be hard, and firm under pressure, blood-letting and depletive measures alone succeed. Not only in purpura but in all diseases, mistakes are continually committed from not attending to this simple rule, and many a life is sacrificed to that bugbear, a quick pulse, which might have been saved had the slightest attention been paid to its force.

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## Art. VI.—*A Collection of Cases of Apoplexy, with an Explanatory Introduction.* By Edward Copeman, Surgeon. London, 1845. 8vo. Pp. 205.

It has been well remarked, that the different meanings attached by different persons to the same word, are the source of most of the controversies and discussions in philosophy, morals, and religion. Locke attempted to show the necessity of accurate definitions in philosophical discussions; and the indispensable obligations of adhering to them. But his example is more spoken of than followed, and the result is, that mankind continue on these subjects to indulge in lengthened discussions, which adherence to definitions would certainly abridge, and might altogether prevent.

The evil is most manifest and prevalent in the sciences relating to mental operations, and the passions and emotions of the human race, and much less so in the exact sciences. Medicine, also, which belongs, at least in most of its subjects, to the former division, has had its share. Though much has been done during the last fifty years to introduce correct phraseology and terminology into its divisions, yet now and then we find that the vague and uncertain use of terms is the source of discussion and inquiry, and not unfrequently of controversy.

The term apoplexy has been employed by various medical authors in different senses. Some who have taken their definitions from the external symptoms, without regard to any internal cause, have defined it as a state in which loss of sense and voluntary motion are observed, while the action of the vital functions, that is, of the heart and arteries, remain. Such was the view of Sauvages, Cullen, Frank, Pinel, and the whole family of symptomatic nosologists. According to this view, the states called narcotism, asphyxia, and the effects of many of the poisons, were referred to the same head.

Others, again, not satisfied with the mere assemblage of external symptoms, and who proposed, in forming a definition, to include also, or at least to regard, the internal pathological state, took a different view. They regarded it as a peculiar lesion of the brain, commonly if not always accompanied with hæmorrhage either into the substance or on the surface of the brain. Such was in a great degree the view of Hoffmann, who described the disease under the name of *Hæmorrhagia Cerebri.* Such also was in many respects the idea of Morgagni, though he admitted other lesions to be the cause of apoplectic symptoms. Such was the notion of Rochoux, of Rostan, of Bouillaud, of Andral, and several other pathological inquirers in modern times. By all these authorities, narcotism in its various forms, whether from alcohol or the narcotic poisons, the stupefying effects of cold, and the comatose state that follows disorder of the stomach or repletion, were excluded from the head of apoplexy and placed under separate categories.

Mr Copeman returns to the old arrangement, and, adopting the divisions of Portal, the very Coryphaeus of symptomatological and conglomerating nosologists, he refers to this head not only those now mentioned, but apoplexy from external injury, or the concussion and compression of the surgeons, apoplexy and epilepsy from pregnancy, the coma taking place at the close of fevers, asphyxia, and even strangulation.

It is doubtless perfectly competent for every one to make his own nosological arrangements; and on these to reason accordingly. But when the distinctions are made the means of conjoining, if not confounding, states which are essentially and pathologically different, and which it has been the object of pathological inquiry to show to be very different, it seems like a retrogradation in science, and something of rejection of its aids, to restore a division which had been found too comprehensive, and which confounded states intrinsically different, and then to show that because different they are, they require different, and it may be opposite modes of treatment.

Without asserting that Mr Copeman's labour is in this manner, and in its present shape, rendered quite useless, we must be permitted to say, that it would have been greatly more useful, had he confined his classification and selection of cases to those which are allowed by the best authorities to constitute apoplexy, and excluded all cases of concussion or compression from violence, cases of narcotism, cases of the coma of fever, cases of the stupor of cold, and cases of the stupor arising from surfeit. We could scarcely name a physician of any eminence who would apply to such states as those now specified the name of apoplexy.

From the causes now mentioned, the numerical statements and other results cannot be regarded as presenting a just view of the subject. A man at 25 receives a stunning blow on the head, and is found, or some time after taken up, in a state of profound insensibility, cold, and pulseless. He is taken home or to an hospital, and if the surgeon knows what he ought to do, he examines the man's head, and finds perhaps a fracture,—or no fracture, but distinct evidence of concussion. Warmth and other remedies are employed; and the man recovers his faculties in a few hours, or perhaps in a day or two. And this is set down as a case of apoplexy at 25 years of age.

A plethoric young woman of 23 is pregnant and neglects her bowels, eating at the same time freely, and taking wine or malt liquor, because she is assured by other females that in that state the system requires much support. At length she tumbles down in a fit of insensibility with slight convulsions, and becomes almost completely motionless and insensible. A medical practitioner is sent for, and, recognising the nature of the case, he takes blood from the arm, orders an enema to be administered, and applies cold to the head; and next morning, when the bowels have been freely moved, the patient is comparatively well. This is, according to the same system, a case of apoplexy in a young woman of 23.

A young man of high spirits and little experience, at the ripe age of 22, dines with a party of friends, it may be at a tavern. The wine is good; the company not indifferent; and the decanters move round the table at a rapid rate. He first begins to speak a little thick; then he thinks he sees two for one of the few that remain. At length he falls down below the table; and he loses all farther recollection of what followed. Next morning, however, he finds himself in a strange apartment, it may be; he does not recognise the usual objects; and he finds he has got into bed with his garments only half removed. He has burning thirst and a good deal of headach. But by various means, and especially after another sound sleep, he is comparatively well, yet with some unpleasant feelings about his stomach. This, then, is a case of apoplexy at 22.

Another diner-out, less fortunate but not less stupefied, goes wandering about the streets, and at last thinks he must have a little more liquor. Accordingly he enters some place, and drinks brandy and water, till he feels that it is no consequence whether he drinks water or not. He sallies out to find his way home. But he feels that the lights dance before his eyes; and after many efforts he sits or lies down in some quiet place, and loses all recollection of any further proceedings. He is found by the police; some of whom convey him to the nearest station. He is carried into a chamber, dark and cold, and laid down with little regard to the freedom of respiration. This takes place at night. In the morning, some one of the attendants enters, and, addressing him, asks him whether he is awake? No answer is given; light is admitted; and the astonished attendant sees not the stupefied and intoxicated man of last night, but a corpse, cold, insensible, and lifeless. This is a case of fatal apoplexy in a person from drinking; and, as the man seems not above 30, it is so inserted in the lists; and conclusions deduced from it accordingly.

We need, after this, say nothing of the persons, male and female, suffocated every week in Paris, by sleeping in rooms with choffers of charcoal;—accidental or intentional; young or old; wise or mad; in love or in despair; in poverty or in riches, it is quite the same;—all die of apoplexy.

Neither shall we say anything of those who, either from disgust at life or other causes, have suspended themselves by the neck, or have been suspended by others; all die of apoplexy.

The catalogue might as well have been made complete, by adding the numbers who are drowned; for, by the same reasoning, that also must be a sort of apoplexy.

Though the truth and justice of these observations must be manifest to all, who have attended to the progress of medical opinion on the pathological characters and nosological position of apoplexy, yet we must take Mr Copeman's statements exactly as he has given them; and this will have the advantage of showing the causes of the discrepancies between his results and those obtained by other authors.

It is first requisite to hear the definition given by Mr Copeman. " The term apoplexy, as commonly applied," says he, " signifies a particular assemblage of symptoms rather than any specific disease; it has more especial reference to the circumstance of a person falling down suddenly, deprived wholly or in part of motion or sensation, and breathing with stertor; but it does not point out with any degree of certainty the particular cause of these symptoms, nor even the state of the system under which they arise; whether it be one of fulness or of debility, whether of plethora or exhaustion."

Where Mr Copeman has received his education, what lectures he has heard, or what works he has read on pathology and the practice of medicine, we are not informed. But we should have thought that it was impossible for any person regularly educated in medicine during the last twenty-five years, to have expressed himself in the manner now noticed. Surely in the writings of

Rochoux, Bouillaud, Andral, and several English authors, the term apoplexy is applied to a specific disease; and when he says that it, that is, we suppose, the term apoplexy, "does not point out with any certainty the particular cause of these symptoms, nor even the state of the system under which they arise," he only tells us that a nosological definition is not a pathological explanation; and that definitions from external symptoms do not convey a full or correct account of any given disease.

There is no doubt, nevertheless, that correct pathological explanations are given; and if the present author had been at the pains to consult any recent work on the subject, he must have seen that it was impossible to write as he has here done. He appears, in short, to have taken Portal as his model, for no other reason than to go back thirty years, and close his eyes, and shut his ears on every thing done by other recent observers, in order to elucidate the characters of this disorder.

The whole of the cases are 250, and in 127 the age is given. From analysis of these, the following results as to age are obtained.

| | | |
|---|---|---|
| 20 cases | occurred | under 20 years of age |
| 30, | do. | from 20 to 30 |
| 31, | do. | from 30 to 40 |
| 31, | do. | from 40 to 50 |
| 25, | do. | from 50 to 60 |
| 30, | do. | from 60 to 70 |
| 25, | do. | from 70 to 80 |
| 5, | do. | 80 and upwards |
| 197 | | |

From this table the author naturally infers, that all ages are liable to apoplexy; and that there is less variation in the liability of different ages than is usually imagined. There is a slight preponderance in favour of the disease between the ages of thirty and fifty; and in a somewhat greater immunity between fifty and sixty. This small difference, however, he thinks, may be explained by the greater number of causes capable of producing apoplexy. This we do not understand. If it mean anything at all, it is that apoplexy takes place according as its causes prevail; which is the case with all diseases. Particular causes, he adds, may prevail at particular ages; but taking them generally, they are scarcely more prevalent at one time of life than at another.

As to the liability of the sexes the difference is greater; there being among the 250 cases 170 males, and 80 females.

The morbid appearances found in the bodies of those who have died with apoplectic symptoms are diversified, and rather opposed to the idea, Mr Copeman thinks, that the cause of death depends on fulness of blood or rupture of vessels.

The number of cases in which the necroscopic appearances were recorded is 156; and in 81 there was extravasation of blood in the brain. In 10 cases no diseased appearance at all was found in the brain. In 65 cases the morbid appearances were hypertrophy of the heart, disease of the aorta, softening of the brain, effusion of serum within the ventricles, or between the membranes, congestion of vessels in the brain, hydatids in the brain, inflammation of the brain, abscess of the brain, hardening of the brain, tumour in the brain, ossified arteries, cerebral vessels varicose, tubercles of the cerebellum, inflamed stomach, inflammation and ulceration of the small intestines, diseased kidneys.

"The mortality of apoplexy," continues Mr Copeman, "is fearfully great, and proves either that the proximate causes of this disease are beyond the reach of art, or that the measures usually adopted as remedies are inapplicable, inefficient, or prejudicial. Of the whole number of cases recorded (250) only 68 recovered; 7 partially recovered, and 175 died; a proportion of deaths to recoveries as 2½th to 1. Is it not a most interesting and important question to determine whether this dreadful fatality can or cannot be lessened by the power of medical science? It has before been remarked that the treatment of apoplexy has hitherto been based upon one general principle; I would seriously inquire what is there in the result of such general principles of treatment to encourage a perseverance in it? Could things be worse under any other plan of treatment, or could the mortality be greater without any treatment at all? Surely there is, under such circumstances as these, a complete justification for leaving the beaten track that has hitherto been trodden with so little satisfaction, and endeavouring to find out a path that might lead us to a more encouraging prospect. It may be said the present plan of treatment has the sanction of all ages, and perhaps its failure is owing to the incurable nature of the disease rather than to an improper use of means to relieve it. Truly, I fear we can never expect to avert the danger to life from apoplexy to any very considerable degree; but we ought not to consider it necessarily fatal; there is danger in so considering any disease that we are called upon to treat; and surely the simple fact of there having been 68 recoveries is sufficient, not only to prove that the disease may be cured, but also to encourage us to hope that, by diligent and patient study, we may be granted the means of rendering less formidable this dire scourge of humanity."—Pp. 4, 5.

This passage is curious for containing more than one contradictory statement; and to us it appears that the conclusions given by no means follow from the premises. These might be modified in something of the following manner.

The great mortality of apoplexy depends on the fact, that, in in the great majority of cases, in which apoplectic symptoms take place, these symptoms are the result of organic changes in the brain, in its arteries or in its membranes. When these symptoms depend either on hemorrhage, on inflammation, or on softening, or on abscess of the brain, or on tumours, or induration of the brain, it is manifest that little can be done for their removal; and the disease will in all cases almost prove fatal. In like manner, when the circulation of the brain is affected and disordered, either in consequence of disease in the tunics of its own arteries, or disease in the aorta or its branches, or disease of the left ventricle of the heart or the mitral valve, it is seldom possible to expect remedies to be effectual, or life to be prolonged. Recoveries also from this disease are by no means permanent. In general the symptoms subside, but return after a few months, sometimes within a much shorter period, or at most one year or two. The number, 68, of recoveries in 250 cases, shows that the disease is little under the control of medical treatment; and that, though we ought always to try the effect of remedies in the hope of averting the fatal termination, yet we are not entitled, in a disease which depends in so many instances on organic changes of some duration, to expect that we can accomplish what may be truly denominated a cure.

Such are the conclusions which we think any unbiassed reasoner would deduce from the facts collected by Mr Copeman. While we cannot admit, that all the cases as classed by him are examples of pure apoplexy, and we feel it our duty to condemn entirely the proposal or practice, whichever it may be, of referring to the head of apoplexy, cases of concussion, asphyxia, narcotism, febrile coma, and strangulation, we think that this collection only proves what all rational physicians have been long maintaining, that apoplexy is too often an affection dependent on the presence of long continued changes in structure, connected either with the period of life, or with the habits of patients. Some other practical distinctions and deductions also, which shall be speedily noticed, we think he might have drawn from the same source.

Before quitting this subject, however, of the pathological causes of apoplexy, we must say, and we do so without any intention of pronouncing a censure on any one, that as to the statement that in ten cases, or even in any greater number of cases no diseased appearances were found in the brain at all, we must either decline attaching to it any importance in the inquiry, or we must say that it does not follow that, because no appearances were recognised, none existed. All persons conversant with morbid inquiries know how difficult it is in some instances to recognise partial softenings, and how easily they are overlooked in the *crura*, the annular protuberance, and the *medulla oblongata*. In one bad and fatal case of apoplectic symptoms, but which was complicated with violent convulsions about the face and neck for about 70 hours, it was found that in the *medulla oblongata* and crura of the cerebellum, there was a degree of white softening, which might have easily escaped the notice of ordinary dissectors.

We return, however, to Mr Copeman. After remarking on the impropriety of the indiscriminate use of blood-letting as a remedy, and its unfitness for several of the forms of the disorder, he proceeds in the following manner.

"The universal *remedy*, as it is called, for apoplexy is blood-letting; at least so generally has it been employed, that of 155 cases in which the treatment is specified, 129 were bled, and only 26 were not. Of the 129 who were bled, 51 recovered and 78 died; the cures being 1 in 2½, the deaths 1 in 1⅝. Of the 26 who were not bled, 18 were cured and 8 died, the proportion of cures being 1 in 1½, and of deaths 1 in 3¼. But the mortality varies a good deal according to the particular method in which blood-letting was performed. In two cases the temporal artery was opened; both died. In 11 cases cupping only was employed; 6 were cured and 5 died. Fourteen were treated by leeching; 4 cured, 10 died. Seventeen were bled in the foot, a plan strongly recommended by M. Portal; 13 were cured and 4 died. Eighty-five were bled generally and copiously; 28 recovered and 57 died; that is to say, two in every three cases terminated fatally. If we subtract the number of cases treated by bleeding in the foot, we find that of 112 cases 38 recovered and 74 died; reducing the proportion of cures to about 1 in 3, and increasing the proportion of deaths to 1 in 1½."

Mr Copeman then proceeds, "From these facts it appears that blood-letting, generally speaking, is so ineffectual a means of preventing the fatal termination of apoplexy, that it scarcely deserves the name of a remedy for this disease. That where the temporal artery is opened the case terminates fatally; but as only two cases are reported in which this method was exclusively employed, there are not sufficient data for establishing the universal fatality of this mode of treatment; although it may be fair to conjecture that it is by no means desirable to abstract arterial blood from the brain; that bleeding in the foot was the most successful mode of abstracting blood; that the treatment without loss of blood was attended with the most success; and that the mortality of the disease increased in proportion to the extent to which bleeding was carried; the more copious the loss of blood, the more fatal the disease."

These are the conclusions deduced by Mr Copeman. Is it possible to draw any other conclusions from the same facts? Let us try.

The remedy most generally employed for the abatement or removal of apoplectic symptoms is blood-letting, aided by laxatives and aperients, cold applied to the shaven scalp, blisters afterwards, warmth to the lower extremities, elevation of the head and shoulders, and low diet. The chief use of blood-letting is to counteract and abate the immediate symptoms of congestion and oppression of the brain, and to gain time for the operation of other remedial agents. In violent cases of the disease, it is supposed indispensable, and is usually carried to a considerable extent. But, as these violent cases indicate a very serious and extensive lesion of the brain, that is, large effusion of blood, and laceration and breaking down of the brain, recovery may either not take place at all, or it may be merely temporary. In the second place, as what is meant by a violent, obstinate, or severe case of apoplexy is, that the brain is affected in parts essential to the continuance of life, for instance, the hemispheres, the base of the brain, especially the middle lobe, the *crura* of the brain, the *pons Varolii*, or the *cerebellum* itself, so the symptoms are little amenable to blood-letting or any remedy, the disease advances rapidly, and death is inevitable, in consequence of the injury done to regions of the brain essential to the functions of circulation and respiration. In short, it is chiefly, if not solely, in severe and violent cases, that large blood-letting is required; and it is in these, accordingly, that the fatal termination is most usual, because most inevitable.

On the other hand, when cases recover under small blood-lettings, or without that evacuation at all, then it is manifest that these cases are comparatively mild. Hemorrhage had been small. It had been confined to a part of the brain not essential to the continuance of life, or the symptoms may have arisen from congestion of the cerebral vessels and impeded circulation. When a large quantity of blood has been drawn, it indicates almost invariably a violent and severe attack, one which requires the use of decided and powerful measures, and one which, therefore, is most likely to terminate unfavourably. When the patient recovers without blood-letting, or with a small blood-letting, there is the strongest reason to conclude that the attack has been slight.

The judicious practitioner, however, will not trust to blood-letting alone. He recommends laxatives and cathartics, cold to the head, perhaps a blister; and, if he thus subdue the immediate and urgent symptoms, places his patient on regulated diet. This is supposing that the case is one of genuine apoplexy.

If he has reason to believe that the apoplectic symptoms depend on disease of the arteries alone, without extravasation, he is still more cautious. He probably avoids general blood-letting entirely, and satisfies himself by getting a small quantity of blood taken from the nape of the neck, or merely shaving the head and applying cold, and at the same time producing revulsion by the administration of purgatives. Still more, if he sees that the symptoms depend on disease of the heart, for instance hypertrophy, he directs his attention rather to the chest than the head, and hopes, by moderating the violent and abnormal action of the heart, to diminish the congested and overloaded condition of the vascular system of the brain. Again, if he finds that the hypertrophy is associated with disease in the mitral valve, or in the aortic valves, he knows, that though he may employ remedies, yet as they cannot restore these valves to their healthy state, or enable them to perform their functions properly, he cannot expect to restore the circulation of the brain to its healthy condition. In short, the judicious physician, while willing and ready to give remedies, in every case, their best chance, yet is aware that apoplexy is the natural termination of various diseases of the vascular system, and of the cerebral vascular system, and is the natural termination of life to a certain proportion of the human race.

Our readers must have observed that Mr Copeman is singular, and aims at originality in his mode of reasoning. What is to be thought of the following remarks?

" May there not be some truth in the hypothesis, that extravasation is promoted rather than counteracted by the greater thinness of the blood and its diminished tendency to coagulate, induced by large bleedings?" " But how can bleeding be beneficial in cases arising from causes which depress and weaken the system." " Similar in absurdity is the practice even now sometimes resorted to, of drawing away the life-blood from persons in a state of collapse from the shock of a severe accident." For the ignorance of practitioners and their blunders surely neither medicine nor surgery ought to be made responsible. Though some rash and ignorant men bleed immediately after such accidents, it does not prove that well-educated and intelligent surgeons would do so.

" Another objection," continues Mr C.," to bleeding, is the fact, that it is of itself capable of producing both paralysis and apoplexy. Many instances will be found in the following cases, in which abstraction of blood was immediately followed by an aggravation of symptoms and by paralysis; and it has been no rare occurrence for persons who have, either accidentally or by intent, wounded a large vessel and lost much blood, to be seized with coma or paralysis. Indeed it has been stated, that loss of blood has a peculiar tendency to induce soporose disorders, and no one doubts the possibility of its occasioning them."—P. 8, 9.

This is a curious mode of reasoning; and is an example of sequence or succession, as a principle of causation, carried to its extreme degree. Is it invariably true, that the fact which follows a preceding fact is the effect of that preceding one? By the same reasoning, night is the effect of day, and day is the effect of the preceding night. There is a class of patients who, whether in hospitals or in private, invariably ascribe all the unfavourable changes and aggravations in their disorders to the remedies employed. It is the blood-letting, the cupping, the blister, or the medicine that has made these persons worse. Never does it occur to them, that it may have been the disease in its natural course. These persons are uniformly the most ignorant and uneducated, the least capable in their order of using the portion of intellect that has fallen to their lot.

It is quite unnecessary to notice all the curious and extraordinary statements made in this short introduction. They certainly deserve attention by their singularity, and the new manner in which the facts are applied. But whether by thus confounding several things essentially distinct, and restoring the confusion, disorder, and uncertainty which, for want of correct pathological knowledge, prevailed fifty years ago, Mr Copeman is to render genuine services to the healing art, is a question which we leave those most competent to answer.

In a certain class of apoplectic cases, nevertheless, Mr Copeman allows that blood-letting may be admissible and serviceable.

"I therefore," he says, "consider it as a practical rule, that if the vessels of the brain are unduly distended, it will be evidenced by fulness of the external vessels of the head; and that unless we discover the latter, we are not justified in drawing blood for the relief of the supposed existence of the former. In my own opinion, the only cases of apoplexy in which bleeding is proper, are those which occur in plethoric habits, and where, in addition to the symptoms, of what is generally understood by a full habit, there is evident distension or fulness of the superficial vessels of the head or neck."

Mr Copeman is so far correct in saying that in many cases of apoplexy the surface at first is cold, the face pale, and the pulse small. And in all cases of this class, no man with any judgment would draw blood at first. It does not follow, however, that in such cases blood should not be drawn at all, or at no time. The appearance of collapse externally in such cases too often indicates the presence of a most severe and extensive lesion internally; and the safe course is to use immediately all such means as may remove collapse without augmenting the subsequent reaction; and then, if requisite, to take blood from the head or from the system. It too often happens, however, that, in such cases, the lesion is seated in a part of the brain essential to life. Vomiting takes place; the pulse becomes irregular; the respiration rapid, irregugular, laboured, and stertorous; and death in no long time closes the scene.

In the apoplectic seizures ensuing on surfeit, (*apoplexia a crapula,*) it surely cannot be said, that, because ignorant persons treat such cases by blood-letting, the practice is either proper or general. Whenever this cause can be ascertained to be acting, the proper course of exhibiting an emetic will assuredly be adopted. Sometimes even it is found that this is unnecessary, and that all that is requisite, is to untie the neckcloth and upper garments, to place the head and neck in a right position, and to give tepid water, if the person can swallow, and if not, to direct the administration of an active enema.

On the merits of this performance, various opinions will doubtless be entertained. It cannot be denied that the preparation of the work evinces the possession of talent, and above all, a talent for originality. Its perusal, nevertheless, leaves on the mind the impression, that the author wrote rather for the sake of bringing out paradoxes, than of throwing light on a subject of obscurity.

The cases are collected from all sources, and given without any attempt at classification or arrangement. Here a case of apoplexy from tumour or other organic change is placed beside one from mere congestion; there a case of drowning (5) is next to a case of obstructed circulation (6); here a case of narcotism from an excessive dose of spirits(14) is placed next to a case of profound apoplexy, from laceration of the brain with copious effusion of blood; and cases without inspections are put down among those with inspections. Such as they are, however, they form the most valuable part of the publication.

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Art. VII.—*The Half-Yearly Abstract of the Medical Sciences; being a Practical and Analytical Digest of the Contents of the Principal British and Continental Medical Works published in the preceding six months; together with a Series of Critical Reports on the Progress of Medicine and the Collateral Sciences during that same period.* Edited by W. H. Ranking, M. D. Cantab., Physician to the Suffolk General Hospital. Vol. I. January—June 1845. London, 1845. Pp. 391.

In this publication the reader finds a very large amount of useful information collected and concentrated.

It consists of two parts. The first is a digested collection of all the recent information communicated through journals, periodical works, and other publications, during the previous six months, on the different divisions of medical and surgical science. The second, occupying nearly the latter half of the volume, consists of a series of Reports, in which the progressive advancement of the different medical and surgical sciences is treated historically and chronologically, and all the improvements introduced, or additions or discoveries or rectifications made, are in due order noticed.

The first portion of the work is subdivided into four parts; I. Practical Medicine, Pathology, and Therapeutics; II. Surgery; III. Midwifery and the Diseases of Women and Children; and, IV. Statistics.

In the second division the reports are in number seven; the first, on the progress of Practical Medicine, Pathology, and Therapeutics, by the editor, Dr Ranking; the second, on the progress of Surgery, by Mr Henry Ancell; the third, on the progress of knowledge in Midwifery, and in the Diseases of Females and Children, by the editor; the fourth, on the progress of Anatomy and Physiology; the fifth, on the progress of physiological and pathological Chemistry, by Dr George E. Day; extensive and detailed, and corresponding with a work already reviewed in this number, the organic Chemistry of M. Simon of Berlin; the sixth, on the progress of Materia Medica and Pharmacy, by Dr George Johnson; and the seventh, on the progress of Forensic Medicine.

Though these reports necessarily contain matter already published in other works; they are nevertheless useful in a high degree, by concentrating in one volume a large amount of scientific information.

The work is well conceived and executed with ability; and we doubt not, that it will be useful to those, who feel that it is their duty to keep up with the knowledge of the day.

# PART III.

## MEDICAL INTELLIGENCE.

### ANATOMY AND PHYSIOLOGY.

*On a Venous Pulse in the Veins on the back of the Hand.* By M. MARTIN-SOLON. (*Bulletin de l'Academie Royale de Medecine*, 8th October 1844.)—M. Martin-Solon's paper on the venous pulse had not reference to the pulsation seen in the jugular veins, depending on a reflux of blood from the right auricle of the heart, but to a pulsation in the dorsal veins of the hand, synchronous with that of the radial and ulnar arteries. When the veins were pressed at their origins at the fingers, so as to empty them, no pulsations were detected; but if rendered full and distended, by being compressed as they passed over the wrist, the pulsation was evident. Pressure on the radial or brachial arteries stopped the pulsation. M. Martin-Solon endeavoured to show that this pulsation could not depend on some of the veins passing over minute branches of arteries, nor on any slight motion of the subjacent tendons. He found it most constantly present in persons who had been labouring under acute diseases for which they were copiously bled. He therefore attributed this venous pulse to the excessive fluidity of the blood, allowing the impulse from the arteries to be communicated to the veins through the capillaries.

*Phenomena of Respiration.* By M. VIERORDT. (*Comptes Rendus des Seances de l'Academie des Sciences*, 11th November 1844.)—M. Vierordt has been making a number of experiments on respiration, and especially on the quantity of carbonic acid exhaled according to the frequency of the respiratory movements. He found that the volume of respired air contained less carbonic acid in proportion as the respirations were more frequent. But the quantity of carbonic acid expired per minute was the same whether the respirations were quick or slow. This law was verified whatever was the quantity of carbonic acid formed per minute,—a quantity, however, which in M. Vierordt at different times varied from 174 to 470 cubic centimetres per minute.

*On the source of the Carbon found in the Human Lungs.* By M. GUILLOT. (*Journal de Pharmacie*, February 1845.)—The carbonaceous matter found in the lungs after death, and sometimes expectorated during life, has usually been regarded as carbon in fine dust drawn into the lungs along with the air during respiration, and deposited in its cells. By Bayle the black deposits were regarded as a particular variety of cancer. M. Guillot, from an extensive series of researches, arrives at a different conclusion. He finds that solid carbon, in a state of excessive minute division, continually accumulates, and is deposited in the lungs of man as age advances, beginning as soon as the adult growth is attained. This carbon is deposited in the thickness of the tissues themselves, and does not come from the exterior. It often accumulates in the pulmonary parenchyma, so as to render the lungs impermeable to air, and thus produces death in those old persons who are attacked with this infirmity. It is a similar deposit of carbon which is deposited around tubercles. This deposit has the property of arresting the further development of these tubercles, and thus so far acts a salutary part in the animal economy. The most singular circumstance connected with the formation of this carbon, is its absence in childhood, and its progressive greater and greater deposition as age advances. From its proportionate amount in the lungs of man, M. Guillot thinks that the age may be guessed at, by noting the quantity of carbon contained in the respiratory organs. It is probable that this deposit of carbon, as age advances, is produced by the carbon of the blood not being wholly consumed. It is known that the respiratory act, and, consequently, the decarbonization, is less active and less perfect as age advances, and, it seems reasonable to suppose, that this is the reason why the proportion of carbon deposited in the lungs increases with age.

*Sulphate of Quinine not absorbed when applied Endermically.* By M. MARTIN-SOLON. (*Bulletin de Therapeutique*, December 1844.)—Many medicines, when applied to the skin either whole or deprived of its cuticle, act energetically on the economy, and may be detected in the secretions, thus showing they have been absorbed. Sulphate of quinine, when given internally in the dose of one grain, may easily be detected in the urine by means of the ordinary tests, as iodide of potassium, &c. Martin-Solon, however, has made many experiments on twenty individuals affected with various maladies, relative to this medicine being absorbed when applied to the skin, and in no case has he succeeded in detecting the slightest traces of the medicine in the urine. The sulphate of quinine was applied by friction to the sound skin, and to that denuded of cuticle, in baths and by means of ointments. The effect was null in all.

## CHEMISTRY.

*On the Preservation of the Human Body for Anatomical Purposes.* By Dr HORNER of Pennsylvania. (*American Journal of the Medical Sciences*, Jan. 1845.)—Dr Horner, after trying all the usual substances, as arsenic, corrosive sublimate, alum, nitrate of potash, &c. used for preserving bodies for dissection, prefers the following, which he says he has used for 23 years:—Liverpool salt 36 ounces, nitrate of potash 19 ounces, carbonate of soda 8 ounces, molasses 4 ounces, starch 2 ounces, and water 6 imperial pints. The salts are dissolved in boiling water, after which the molasses are added, and then the starch previously beat up with cold water. The whole is brought to the boiling point, and when sufficiently cold is ready for being injected into the arteries of the body. The quantity is sufficient for one subject, and distends both arteries and veins. Dr Horner says this quantity will keep the body good for two months in winter; but if to be kept for a longer period, he recommends a larger quantity to be used, and the body to be rolled in salt and saw-dust, or oiled cloth, or an old oil barrel, &c. This injection impairs the great nervous centres, renders the mucous membranes soft and puffy, and allows the cuticle to drop off; but it renders firm the skeleton, ligaments, cartilages, muscles, &c.

*On the Action of Charcoal on Liquids containing Metallic Salts in solution.* By M. CHEVALLIER. (*Annales d'Hygiene Publique*, Jan. 1845.) Besides the property which charcoal is known to possess of decolorising coloured solutions, MM. Payne, Lassaigne, Berzelius, and Graham have shown that it also exerts some action on a few metallic solutions, chiefly sub-salts. M. Chevallier has examined this subject more fully than any other, having, in perfect ignorance of Graham's observations, began his course of experiments in 1843. His attention was first drawn to the subject by having had to examine wines which contained a considerable quantity of salts of lead, but which, after being discoloured by charcoal, were found free of that metal. M. Chevallier's paper only details his experiments on the salts of lead, but it demonstrates satisfactorily that all the salts of that metal are decomposed by animal charcoal; the lead uniting with the charcoal in the form of an oxide, leaving the acid free in the fluid. Vegetable charcoal was found to decompose the salts of lead more feebly, and not to act at all on the nitrate of lead in solution. Charcoal exerts this action on the various salts of lead whether they are in solution in wine, vinegar, alcohol, distilled waters, or water; and the action is greatly promoted by ebullition.

This property which charcoal possesses of separating metals in the form of oxides from their saline solutions, M. Chevallier thinks ought to be more generally known, seeing that it may, and perhaps is often the cause of a false result being arrived at in medico-legal inquiries. It is in many cases directed to decolorize the suspected liquid by means of charcoal previous to applying the tests for the presence of the metal. M. Chevallier condemns this, as it removes the very metal for which the whole analysis was made.

*On the Existence of Iodine in the Sulphureous Mineral Springs of the Pyrenees.* By M. O. Henry. (*Journal de Pharmacie*, January 1845.) —As iodine was discovered by M. Henry in the mineral springs of Evaux, Neris, Vichy, and St Honore; and as M. Cantu discovered the same element in the springs of Piemont, and it has been since discovered in the waters of Challes in Savoy, and in those of Aix, M. Henry thought it might also exist in the sulphureous springs of the Pyrenees. On examining the waters of several of these springs, he found iodine to be distinctly present, he thinks, in the state of an ioduret of sulphur. He mentions at the same time that the alkali which exists in these springs does not exist in the state of a carbonate, but of a silicate, and only becomes a carbonate by exposure to the air.

*Copper and Lead naturally contained in the Human Body.* By M. Devergie. (*Annales d'Hygiene Publique*, January 1845.) This paper is intended as supplementary to his former one, in which he, in conjunction with M Hervey, announced to the Academy of Sciences the existence of copper and lead in the tissues of the human body. In addition to his own observations, M. Devergie has collected the scattered observations of chemists and medical jurists as to their occasional notice of the presence of copper and lead in the ashes of animals and vegetables. From these notices it appears that copper and lead exist in almost all our usual articles of diet, both animal and vegetable, and that copper in especial seems to be the chief agent in giving colour to certain esculent vegetables. M. Devergie has discovered and exhibited the presence of copper in a natural state in wheat, barley, rye, oats, rice, tea, coffee, sugar, sorrel, chicory, chocolate, gelatin, the flesh of the ox, &c. &c; and it is to copper that he attributes the peculiar green colour of sorrel, spinage, and artichokes. The conclusions which M. Devergie draws from his experiments are the following:

1. The stomach, intestines, and all the organs of the animal body, furnish on analysis traces of copper and of lead.

2. The proportion in which these metals are found augments with age. It is trifling in the new born child, but is more considerable in the adult.

3. A prolonged disease, during which the food is greatly diminished, appears notably to diminish the quantity of copper and of lead in the animal body.

4. This difference permits us naturally to infer that the source whence these metals are derived, is the meat and vegetables used as food.

5. In all cases the proportion of copper is greater than that of lead.

### MEDICAL PATHOLOGY.

*Case of Monstrosity.* By M. Nicolas. (*Bulletin de l'Academie Royale de Medecine,* 22d October 1844.)—M. Nicolas presented to the Academy of Medicine the body of a new-born infant, in which the bones of the upper portion of the cranium were awanting. A considerable portion of the brain escaped during its delivery, yet the child lived an hour, and uttered strong cries.

*Aneurism of the Basilar Artery.* By M. Pfeufer. (*Allgemeine's Repertorium,* March 1844.)—A man, aged 41 years, had for many years experienced an occasional sudden inability to swallow. After suffering for a long time from severe headach, he was suddenly seized as with an apoplectic stroke, during which the breathing was stertorous, the eyes open; the fæces and urine passed involuntarily. He recovered, however, in a few days, when he had a second similar attack commencing with constriction in the pharynx, but not followed by complete loss of consciousness. He recovered, but on his entry into the hospital presented the following symptoms. He was thin and weak looking, and complained of a pain and stiffness along the spine, and in the lower extremities. He had headach, with sensation of pressure on the brain, and constant ringing in the ears. His speech was quick, indistinct, and his voice hoarse. He was seized again with loss of sensation, &c. a few days after being in the hospital, with dilated insensible pupil, stertorous breathing, involuntary evacuations of urine and feces, &c. He continued to scream without being able to speak, but recovered under copious blood-letting, ice to the head, blisters, &c. Fifteen days after this attack he suddenly expired.

The *pia mater* was raised by serous infiltration. The surface and posterior part of the hemispheres of the brain were tinged with alternate spots of deep and faint red, and reddish-yellow, due to a layer of extravasated blood, partly old, partly recent, lying between the membranes. Bloody serum filled the ventricles. The fornix was in part destroyed; the median parts of the brain softened and injected; the aqueduct of Sylvius filled with a fresh coat of blood; and the peduncles of the brain injected and softened in their superficial layers. The *pons Varolii, medulla oblongata,* and cerebellum, were covered by a layer of recently coagulated blood. On the right side of the basilar artery there existed an aneurismal sac of a reddish-blue colour, four lines long and three lines broad, filled with clotted blood, and pierced at its anterior and lower part with an orifice the size of the head of a pin. The artery in the neighbourhood was atheromatous, and several of the other arteries presented patches of the same degeneration. In the spinal canal there was a thick newly formed clot of blood between the *pia mater* and arachnoid membrane. On many points marks of old sanguineous extravasations were remarked of a brown colour. The external layer of the spinal chord was coloured of a saffron yellow colour. The abdominal and thoracic viscera were healthy.

*Case of complete Ossification of the Semilunar Valves of the Aorta.* By M. Pichler. (*Archives Generales de Medecine,* July 1844.)—A man, about 47 years of age, subject to gout, was, in consequence of exposure to cold and wet, seized with pain in the chest, difficulty of breathing, palpitation of the heart, dry harsh cough, numb feeling in the arms, and considerable fever. After some weeks œdema of the extremities was remarked, and the palpitations caused intense anxiety and anguish. The urine was scanty; the pulse irregular and intermittent. A humming noise, attended with a somewhat whistling sound, was heard at the base of the heart, corresponding with its impulsion against the side. These symptoms became more aggravated, and he died in little more than a month after the inflammatory attack.

The lungs adhered to the pleura. There was considerable œdema of the middle and lower lobes of the right lung, and hepatization of the lower lobe of the left lung. Much serosity was found in the pleura and pericardium. The heart was double its usual size; the right ventricle as well as the corresponding auricle much dilated. The tricuspid valve was rendered useless in consequence of the excessive dilation of the auriculo-ventricular opening; the mitral valves, however, were normal. The semilunar valves of the aorta were completely ossified. Both ventricles and auricles were full of clotted blood.

*Observations on the Pulse of the Insane.* By Dr Pliny Earle. (*American Journal of the Medical Sciences,* January 1845.) Dr Earle, anxious to ascertain the relative velocity of the pulse of the insane, addressed letters to the physicians of several of the lunatic asylums in the United States, and, in the present paper, has published in detail the answers to his inquiries, containing the observations of eleven physicians of lunatic asylums. From the observations of nine of these physicians it appears, that, in 42 recent cases in males, the pulse averaged 81 in the morning, 77 in the evening, and 72 when in bed. In 145 chronic cases in males, the pulse averaged 77 in the morning, 73 in the evening, and 67 when in bed. In 39 recent cases in females, the pulse averaged 78 in the morning, 73 in the evening, and 79 when in bed. In 112 chronic cases in females, the pulse averaged 81 in the morning, 78 in the evening, and 77 when in bed.

In Dr Woodward's return of 40 recent and excited cases of insanity, the pulse averaged 80 in the males and 81 in the females. In 216 chronic cases, the pulse averaged 71 in the males and 72 in the females. In 54 cases of dementia, the pulse averaged 68 in the males and 69 in the females.

In Dr Wyman's returns the general average of the pulse of 164 males was 74, and of 73 females, 85 per minute.

The general conclusion drawn from these facts is, that, in insanity, the average pulsations are quicker than in a state of health.

*Extraordinary Effects of a Stroke of Lightning.* By Dr Le Conte, of Savannah. (*New York Journal of Medicine,* November 1844.) Five negroes were simultaneously prostrated by a stroke of lightning on a plantation in Georgia, and were all taken up in a state of apparent death. The first, a girl of thirteen, was sitting on the branches of a mulberry tree, and was so instantaneously killed that her body did not fall to the ground, but had to be taken down from the tree. The second, a child of six, was standing immediately under the tree, and she was also instantaneously killed. The third, a negress of forty, was about ten feet from the tree, and about five feet further from it than the fourth and fifth, who recovered; she was also instantaneously killed. No external mark of injury was observed on the bodies of the first or second, but a burned spot about the size of a dollar was observed under the right axilla of this woman. Her clothes were also ignited, but whether by the electric fluid or by the ashes of her pipe could not be ascertained. The fourth, a woman twenty-nine years of age, was standing between the tree and the last woman; she remained insensible for some time, but gradually recovered. The skin over the right shoulder was abraded to the extent of a dollar, and her clothes were rent into shreds. The skin over the right side of the body was blistered and marked with discoloured streaks, which also extended over the abdomen and pubes. No vomiting or burning pain of hands or feet occurred in this case. She had been married for several years, but had never been pregnant. Before the shock, her menstruation was regular; since that time it has been very irregular, often two months absent, and much diminished in quantity. Her health has been bad since she was struck, and for three weeks after that occurrence she complained of pains in the stomach and bowels.

The fifth person struck was a woman of seventy years of age, who also stood between the negress who was killed and the tree. She also gradually recovered consciousness. A violent paroxysm of vomiting followed the restoration to sensibility, and continued obstinately for ten or twelve hours. She complained much of pain in the stomach and bowels for at least two weeks. Her clothes were rent into shreds, and marks of discoloration were noticed along the right arm and right side of the trunk. A troublesome sensation of burning was experienced in the palms of her hands and soles of the feet; and in the course of two or three weeks a swelling made its appearance under the right foot, which resulted in the exfoliation of the thickened and hard cuticle. "The catamenial discharge, which had, in accordance with the ordinary arrangement of nature, ceased for more than twenty years, was completely, and thus far, permanently re-established." The discharge possesses all the obvious physical characters of the catamenia, appears with undeviating regularity every month, and has continued to the present time, now upwards of one year. The menstrual discharge had ceased with her in the usual manner, when between forty-five and fifty years of age, and she had never since then had any uterine flux till struck by the lightning.

*Sudden Death from Spontaneous Rupture of the Stomach.* By Sig. Morici. (*Annali Universali di Medicina*, April 1844.)—A man, 30 years of age, who had been several times cured of intermittent fever, was seized again with the same disease on the 21st of January. Quinine and other remedies produced a cure in ten days. A bitter decoction, however, was continued for five days longer, during which he had no fever, when on the fifth day he was suddenly seized with violent pain in the lumbar region. There was, however, no fever, no swelling, redness or abnormal heat, nor hardness at the seat of the pain. The pain was aggravated on pressure, and the patient continually sat erect in bed, as it was impossible for him to lie on his back or side. Next day feverish symptoms made their appearance, accompanied with retraction of the right testicle, difficulty of making water, and a sensation of constriction in the sphincter of the anus. By the third day the fever had abated, and he was even able to take a little soup. In the evening he rose to go to the water closet, and in returning to his bed fell down dead.

The thoracic viscera were found healthy, as were also the abdominal, with the exception of the stomach, which was ruptured on its anterior surface, almost in its very centre. The aperture was about three fingers' breadth in length, and had allowed the contents to escape among the abdominal viscera. Although the margins of the aperture preserved their natural texture, they were slightly hypertrophied and dotted with redness. The same dotted redness was remarked on the mucous membrane of the stomach a short distance around the rupture, but the membrane retained its natural texture, and had undergone no pathological changes.

Sig. Morici could not account for the production of the rupture, unless it were the straining at stool acting on a part of the stomach, weakened by circumscribed inflammatory action of the mucous membrane, as indicated after death by the dotted redness. In this, as in all other recorded cases where the stomach has been found ruptured, the death was sudden, and was not attended with hæmorrhage, or rupture of any arteries or veins of importance.

*Rupture of the Spleen.* By Dr Herrick. (*American Journal of the Medical Sciences*, January 1845.) A man, in a scuffle with another, received a blow in the left hypochondriac region, wrestled thereafter for five or ten minutes, then suddenly became faint and pale, staggered, and sunk helplessly on the ground, complaining of nausea, faintness, and pain in the left side. He expired in about fifteen minutes. No marks of violence were observable on his body. About two ounces of serous fluid were found in the pericardium; the other contents of the chest were natural. The abdomen contained about three quarts of partly clotted blood, which was found to have escaped from a large lacerated rent in the posterior part of the spleen, which was nearly five times its natural size, and so soft as to be easily broken down with the slightest pressure of the fingers.

*Colon strangulated by the Mesocolon.* By Dr Davis. (*Boston Medical and Surgical Journal*, December 1844.) A gentleman, twenty-six years of age, was attacked, on the 13th October 1843, with paroxysms of pain in the epigastric region, without tenderness, but with remarkable tonic rigidity of the abdominal muscles, and constipation. By the use of cathartics, enemata, and opiates, the bowels were moved after three days, and he gradually recovered. On the 15th May 1844, he experienced a similar attack, but on this occasion there was superadded constant vomiting. There was no thirst; the firmest pressure on the abdomen caused no pain; there was much nervous agitation. The patient complained that there was stoppage in the epigastric region, and said he felt assured he would be better if his bowels could only be moved. No treatment succeeded in giving him relief, and he died on the 9th inst. A large knot of intestine, about thirteen inches in length, was found strangulated in an aperture about the size of a shilling in the meso-colon. It was of a dark port wine colour, and was about four feet from the termination of the anus.

*Essay upon Cretinism and Goître.* By Edward Wells, M.D., late Fellow of New College, Oxford. London, 1845. Pp. 69.—Dr Wells's attention was particularly directed to the subject of cretinism and goître during a professional residence at Interlachen, where he had frequent opportunities of visiting the institution established upon the Abendberg, in the Canton of Berne, for the education of infant cretins. After a brief account of some of the writers on cretinism and a description of the cretin, Dr Wells endeavours to ascertain what is the proximate cause of cretinism. He therefore endeavours to trace the origin of the disease. The child is not always born a cretin, or rather is very rarely so, and Dr Guggenbuhl, the founder of the establishment at Abendberg, states that it is impossible, during the first months of life to decide whether a child will be a cretin or not. The first symptoms of cretinism manifest themselves about six months after birth, during the first dentition, by a more or less universal rachitic affection of the osseous system. The extremities of the long bones enlarge, the bones become softened and bend, the spinal column becomes twisted more or less, and at last the cranial bones are involved in the disease. The abdomen becomes enormously enlarged and pendulous, the appetite is irregular, occasionally voracious, the bowels are constipated, the skin is cold and flaccid, and the muscular system flabby. Subsequently the child's intellect becomes overshadowed, and he becomes a true cretin. The proximate cause of the disease, therefore, the author attributes to a morbid state of the blood, which is deficient both in quantity and quality; a morbid state produced, he asserts, by residing in an unhealthy atmosphere, bad food, want of cleanliness, and neglect of moral education.

In the chapter on the exciting causes, he enters more fully into the subject of the atmosphere at the bottom of the deep and narrow alpine valleys being the essential exciting cause of cretinism. He endeavours to show, that, however other authors explain the facts differently, all allow that cretinism and goître abound chiefly in those close alpine valleys where the air is damp from the evaporation of stagnant water, noxious from the want of ventilation, and heated by the reflection of the solar rays from the surrounding rocks. While the author does not deny the influence of hereditary descent in propagating the disease, he shows that it also originates in the children of healthy parents who go to reside in districts where cretinism abounds.

Dr Wells next shows that cretinism shows itself in four different forms: *1st*, Goitre; *2d*, Affections of the bodily development; *3d*, Affections of the senses; and *4th*, Affections of the mind. All these may exist together, or in different combinations, as is most generally the case. He endeavours to show that there is no connection between the strumous or scrofulous habit of body and cretinism, but unfortunately every fact, every symptom he records as marking the invasion and progress of cretinism, proves the very reverse. Rickets is now universally acknowledged to be one of the forms of scrofula, and every cretin primarily passes through this undoubted scrofulous state. Scrofulous tumours consist of albuminous matters very generally associated with phosphatic earths; in goître actual concretions of phosphate of lime are recorded to have been frequently met with. The most successful therapeutic and hygienic treatment for the scrofulous is the administration of iodine, with tonic and nutritious diet, pure air, &c., as Lugol's researches have most abundantly proved. We know that iodine is the essential remedy in the treatment of goître; and at the establishment of the Abendberg, Dr Guggenbuhl trusts entirely to that very hygienic regimen which Lugol shows is so essential for the removal of scrofulous affections; and has actually found the use of cod-liver oil, whose principal therapeutic action depends on the iodine it contains, of great service.

If other arguments were wanting to supply those links of the chain which prove all the varieties of cretinism to be but forms of scrofula, they are supplied by the author in his seventh chapter, where he treats of the diseases to which these unhappy beings are liable. Thus, besides rickets, it is stated they are "particularly subject to glandular swellings, scrofulous ophthalmia, hernia, epilepsy, diarrhœa, asthma, marasmus, and apoplexy," convulsions during teething, mania, &c.; and lastly, we cannot but wonder how the author could conclude that cretinism is not a form of scrofula, when he himself states that the cretin is usually cut off by "marasmus, tubercles in the lungs, and water in the chest."

The last chapter contains remarks on the physical and moral education of the infant cretin, more especially as pursued by Dr Guggenbuhl at the Abendberg. This consists in living in a pure air, giving wholesome and nutritious food, especially animal food, clothing the body warmly, exciting the circulation of the skin by means of hot baths and frictions, and using roborant medicines, as bark, steel, and cod-liver oil. It is not stated whether any preparation of iodine is itself used, but it may be gathered from the tone of the remarks that it is. The instruction seems to be conveyed to these poor children much on the same general plan as at our infant schools, combining amusement and recreation with instruction.

*Recovery from Wound of the Head, with loss of substance of the Brain.* By M. ROUELLE. (*Comptes Rendus des Seances de l'Academie Royale des Sciences*, 14th October 1844.)—An individual was struck over the head, in a quarrel, with a heavy baton, and instantly fell. M. Rouelle, who saw him within a quarter of an hour after the accident, recognised a comminuted fracture on the superior part of the skull. A portion of the cerebral substance, about the size of an apricot stone, had escaped through a wound situated over the union between the frontal and right parietal bone. At this time the person did not present any symptoms of intellectual lesion;

he answered readily and collectedly to questions addressed to him relative to the seat of the pain, &c. The whole left side of the body, however, was paralyzed; the mouth, however, was not drawn to one side. Notwithstanding the gravity of the accident, and the occasional severe symptoms which occurred during the course of the treatment, a cure was effected. By the end of six months the patient had quite recovered the use of the leg; the arm, however, still remained paralyzed.

*On the Causes of Plague.*—By M. HAMONT. (*Bulletin de l'Academie Royale de Medecine*, 29th October 1844.)—M. Hamont terminated his long memoir on the plague, the reading of which occupied more than one meeting. From the numerous facts which he brings forward, he concludes that plague owes its origin to a reunion of many different causes of insalubrity in the houses of the fellahs or peasants in Egypt, aided by heat, humidity, the unwholesome south wind, &c. He consequently concludes that plague is in a great measure the work of man, and not the result of an assumed epidemic or endemic constitution of the atmosphere. As experience, however, has proved that plague once originated may be propagated from man to man by contagion, or through means of goods, M. Hamond concludes, that lazarettoes are necessary in a sanitary point of view. He thinks, however, that the system of quarantine may be advantageously modified,—as, for instance, that vessels with clean bills of health should not be subjected to a longer quarantine than fifteen days, counting the days they have been on the voyage from the suspected port.

*Escape of a Tænia solium through the Umbilicus.* By M. SIEBOLD. (*Archives Generales de Medecine*, June 1844.)—In April 1841 a man, 22 years of age, was received into the hospital, labouring under scrofulous abscesses in various parts of the body. A little above the umbilicus there existed a considerable deposit of softened scrofulous matter, and a small abscess, which opened immediately over the umbilicus, gave it the appearance of that of a new-born child. One day something was felt moving within this abscess over the umbilicus, and was found to consist of a loop of the intestinal worm, the *Tænia solium.* This loop appeared to be endowed with life, was white, but no trace of chylous or excrementitial matter was observed. On pulling out this loop one extremity was discovered to become more slender, as if near the head, and on pulling at this end the entire head of the worm was drawn out. The tail portion was afterwards extracted with ease by means of gentle traction. The worm was several yards long, and when put into lukewarm water, moved about and appeared quite healthy. No gas or feculent matter escaped from the aperture through which it escaped, nothing, in fact, which could make it be supposed that the animal has come through an intestinal perforation. No bad symptoms followed this escape of the tænia. The probe could not detect any communication with the intestine, on account of the acute pain which such exploration caused. The patient died about a year afterwards, but leave to open the body could not be procured.

*Pulmonary Fistula consecutive on a Scrofulous Necrosis.* By M. GRAPIN. (*Archives Generales de Medecine*, October 1844.)—A young man, 17 years of age, but not apparently more than 12, and of scrofulous parents, when 13 years of age, became affected with scrofulous tumours and abscesses which opened in many parts of the body. On the 30th of July 1844, he was in the last degree of marasmus, with cough, purulent expectoration, and difficult breathing, with diarrhœa. Over the fifth rib of the right side, below the margin of the pectoral muscle, was a considerable sized opening, from which air and purulent matter escaped with a whistling noise during expiration. This had existed for eight months. It was previous to that time an abscess, which had opened and continued to discharge matter ever since. The rib under the opening was carious. There was no symptom of effusion within the chest or of pneumo-thorax. The chest was sonorous on percussion, excepting immediately around this aperture, where the mucous rattle was observable. On the side of the neck was a fistulous opening which communicated with the third and fourth cervical vertebræ, which were carious; œdema of the extremities, swelling of the glands, &c. were present.

On his death, it was ascertained that the opening opposite the fifth rib communicated with a sac in the lung, into which one of the larger bronchii entered. The lung at this point was adherent to the chest, and the rib was carious and fractured. In the sac in the lung was found a triangular shaped sequestrum from the rib. The interior of the cavity was lined by a shining membrane apparently continuous with the mucous membrane of the bronchus. Miliary and agglomerations of gray tubercles were found scattered throughout the lungs.

*Discharge of a Lumbricus from the Male Urethra.* By Dr **Peter Clark.** (*New York Journal of Medicine*, May 1844.)—A man, 33 years of age, discharged a lumbricus teres, eleven inches long, from the urethra. About eighteen months previous he had laboured under symptoms of disease of the bladder, when Dr Clark thinks a communication was formed by ulceration between the rectum and that organ; and he supposes the worm may have thus passed from the gut into the bladder and then been discharged from the urethra.

*On the Action of Vinegar in which Cantharides have been killed on the Animal Economy.* By M. **Brame.** (*Bulletin de l'Academie Royale de Medecine*, 22d October 1844 )—The peasants of Touraine kill the cantharides which they collect for sale in vinegar, which they afterwards use for domestic purposes. This practice every now and then leads to severe accidents, and in some cases even produces death. The symptoms are those of an intense gastro-enteritis, which they are accustomed to regard as of spontaneous origin, and not from the use of this poisonous vinegar. M. Brame, however, traced this affection to the vinegar, and is convinced that a certain proportion of cantharides is dissolved by the vinegar whilst these insects are immersed in it. Pure vinegar given to dogs killed them; producing vascular engorgement with black plastic blood. Dogs killed by the cantharides vinegar exhibited the same morbid appearances, but in a more marked degree. They, however, also presented, which was wanting in the others, a remarkable contraction of the bladder, which was reduced to the very smallest possible dimensions, and a marked inflammatory action in the kidneys, ureters, and mucous membrane of the bladder. The gastric fluid was also found to be rendered alkaline and albuminous; and albumen was also detected in the urine. The dogs poisoned by the cantharides vinegar did not decay so rapidly as the others.

## THERAPEUTICS.

*Barley-Water a powerful Diuretic.* By M. **Themont.** (*Journal de Pharmacie*, February 1845.)—According to M. Themont, barley-water is a powerful diuretic, and may be employed with advantage in cases where more powerful diuretics might prove deleterious. He boils two handfuls of barley in three pints of water down to two pints, and gives a cupful five or six times daily. He relates a case of dropsy depending on hypertrophy of the heart, in which, by this simple means alone, a copious diuresis was produced which removed the dropsical swellings in a few days.

## SURGICAL PATHOLOGY AND THERAPEUTICS.

*Case of Fracture of the two first Cervical Vertebræ.* By M. SPANGENBERN. (*Allgemeine's Repertorium*, January 1844.)—An officer, 28 years of age, fell from his horse on the 8th July 1839, and lighted on the side of his head on softish ground. He immediately remounted, and rode about half a league, when, on arriving at a village, he heard something give way with a crack in his neck, and fell insensible to the ground. Some minutes elapsed before he recovered consciousness, when he felt he could not keep his head erect but by the aid of his hands. When brought to the military hospital, a swelling of about the size of a five shilling piece was remarked over the left parietal bone, a little behind the coronal suture. At the upper part of the nape of the neck there existed a considerable swelling, in the middle of which there could be felt a hard apparently mobile tumour over the seat of the axis, and having the form of the spinous process of the seventh cervical vertebra. The least pressure on this part, or the slightest attempt to rectify the position of the head, or cause it to perform the movement of rotation, caused the most acute pain. The slightest movement also caused a crepitating sound to be distinctly perceived. The head hung forwards, with the chin on the sternum. There were no symptoms of any injury of the spinal marrow. Blood-letting and other antiphlogistic treatment had the effect of subduing the inflammatory action which followed this injury, and after some months of treatment he recovered, so far as to be able to walk about, having his head supported by the apparatus of Shaw. In the spring of 1840 violent pains in the neck and pharyngeal region, with marked symptoms of chronic inflammatory action of the cervical vertebræ, again laid him up; but notwithstanding active treatment by leeches, stimulant frictions, moxas, and the actual cautery, abscesses opened in several places, and he died, worn out by hectic fever, and discharge from the sores, but without having had any affection of the spinal chord, in the month of October 1841.

An abscess filled with purulent matter was found under the superficial layer of muscles over the nape of the neck: those nearer the vertebræ were partially destroyed by suppuration, or degenerated. The transverse processes of the third and fourth cervical vertebræ were carious, as were also the bodies of all the vertebræ at this part of the neck. The ligaments and interarticular cartilages, especially those of the atlas and axis, were swollen and corroded. A large abscess, containing four ounces of fetid purulent matter, extended from the occipital hole to the seventh cervical vertebra; it communicated with an abscess which had opened under the clavicle by means of a fistulous opening. The posterior arch of the atlas was fractured near its articular-process; it was carious and absorbed to a considerable extent. The body and transverse processes of the axis presented the same kind of degeneration. The odontoid process was fractured; its ligaments in part destroyed; yet the spinal chord was uninjured and apparently normal. The brain was healthy.

*Guinea-worm extracted from the foot of an old soldier at Paris.* By M. MAISSONNEUVE. (*Archives Generales de Medecine*, December 1844.)—The patient was an old soldier, who had been two years and a half in Senegal, where he had frequently walked on the damp ground barefoot. During the time he resided there he never knew of any of the whites being attacked with the guinea worm, but it was common among the blacks. It was four months after his return from Senegal, exclusive of the time occupied in returning, that he first remarked a faruncolous tumour on the dorsum of the foot, and another on the upper and outer side of the leg, a little below the head of the fibula. On making an incision into the tumour on the foot, a coil of a guinea-worm, (*Filaria medinensis*,) made its appearance, but was broken in attempting to extract it. Abscesses formed round the ankle-joint, on opening which at different points fresh portions of the worm presented and were removed. The most curious fact observed was that, on pressing the upper tumour, a small quantity of a whitish liquid, like whey, escaped; and on examining this with the aid of the microscope, it was found to be swarming with myriads of small cylindrical worms, having a tapering tail and a soft but not inflated head. From this tumour there extended a hard cord like a varicose vein down the leg, and on opening this at two points two worms were extracted. The upper one, that which occupied the tumour, was found filled with a whitish liquor, containing myriads of the same small cylindrical worms observed in the fluid pressed out of the tumour,—in fact, young Filariæ. These young worms lived several days, and provided the liquid in which they were was not allowed to become quite dried up, recovered on being moistened. They did not seem to revive when they were allowed to continue dried up for any length of time. These facts are important, as it was not known how the guinea-worm propagated or got into the feet. M. Maissonneuve supposes that when walking barefoot on the damp soil of Senegal, one of these very minute worms had buried itself under the skin, and had remained there unobserved till its increasing size had caused the part to inflame, and attract the notice of the patient.

*Congenital Hypertrophy and Prolapsus of the Tongue cured by Operation.* By Sig. Federici. (*Archives Generales de Medecine,* July 1844.)—A child, born of a healthy mother, had such a hypertrophy of the tongue, that it projected from its mouth, and hung over its chin. As the child grew the tongue seemed to enlarge still more, and with its years attained a most enormous development, preventing it from emitting any but monotonous and suppressed sounds. Sig. Federici proposed to remedy this deformity by means of an operation. By means of two incisions, which united at an acute angle at the base of the tongue, the whole projecting portion of the tongue was cut off. The two surfaces were then brought into contact, and kept in position by means of three points of interrupted suture. Perfect union took place; and by the twenty-sixth day the child was entirely free from deformity, and its speech restored. It was exhibited to the Faculty of Medicine at Naples, who bore witness to the completeness of the cure.

*On Incision of the Tunica albuginea in cases of Inflammation of the substance of the Testicle.* By M. Vidal of Cassis. (*Annales de Chirurgie,* September 1844.)—All surgeons know that inflammation of the substance of the testicle is a more dangerous disease than inflammation of the epididymis or of the *tunica vaginalis,* which are the ordinary consequences of blenorrhagia. Inflammation of the substance of the testicle is often attended by intense pain, which it seems rational to attribute to a kind of strangulation produced by the unyielding nature of the *tunica albuginea.* When this pain continues long, is of an intense nature, and obstinately resists the usual therapeutic means, suppuration of the testicle is to be dreaded. With the view of relieving these intense pains, and preventing the termination in suppuration, M. Vidal exposes the testicle and carefully divides the *tunica albuginea* by a longitudinal incision. He has already performed this operation fifteen times successfully; and in answer to any supposed permanent injury which the testicle might be supposed to receive from injury of the semeniferous canals by the incision, or from the testicle becoming fixed in consequence of union with the cicatrix, M. Vidal answers, 1. The inflammation of the testicle ends in resolution after the operation. 2. The wound of the *tunica albuginea* becomes confounded with that of the serous and other membranes, and the whole form a single cicatrix. 3. The cicatrix becomes linear, and then the testicle is found to be but slightly adhering to the other membranes. 4. Lastly, the testicle recovers its entire freedom, its ordinary volume, and normal consistence.

*On the best mode of dressing recent Wounds.* By CHASSAIGNAC (*Comptes Rendus des Seances de l'Academie Royale des Sciences,* 11th November 1844.)—M. Chassaignac has, for three years past, dressed all wounds, even those complicated with fractures and projection of the bones, so as to exclude them as much as possible from the air. He covers the part with imbricated layers of common diachylon plaster, exactly as in Baynton's plan of dressing old ulcers, then surrounds this with linen covered with cerate and riddled with small holes, over which is placed compresses of charpie and a bandage. The whole is left undisturbed for eight or ten days. Should the suppuration, however, be very abundant, some of the charpie is removed and fresh thing put on. M. Chassaignac states that this plan is greatly preferable to that usually employed in France, as the wounds heal faster, there is less suppuration, and traumatic pain and fever are greatly diminished.

*Urethroplastic, or Restoration of the Urethra.* By M. JOBERT. (*Archives Generales de Medecine,* December 1844.)—A man, in consequence of losing about three inches of the lower portion of the urethra and adjoining integuments, from gangrene supervening on an extravasation of urine, applied to M. Jobert. When his constitution had sufficiently recovered the effects of this severe injury, M. Jobert removed a flap of integument from the scrotum and back of the penis, and applied it to the parts where the urethra had been destroyed. A fine catheter was left in the bladder till the cicatrization was completed. The operation succeeded. The patient now makes his water freely through the restored urethra, only the penis remains slightly curved in consequence of the cicatrix resulting from the removal of the integument.

### OBSTETRICS.

*Rare Case of Delivery during Sleep.* By Dr SCHULTZE. (*Medicinische Zeitung,* No. 31, 1844.) Dr Schultze was called to a woman who had arrived at her full time with her fourth child, but who had fallen into a state of somnolence so profound that she could not be awaked out of it either by blows, shaking, or acrid vapours. On the third day of this unnatural sleep she was delivered unconsciously, and without awakening, of a living male child. The next day she awoke shortly before Dr Schultze arrived, had no recollection of her accouchement, and was quite astonished to find herself delivered. This is an important fact for medical jurisprudence, and it is on that account it is recorded by Dr Schultze.

### TOXICOLOGY.

*Danger of Arsenical Injections in subjects intended for Dissection.* By M. BENOIT. (*Journal de Pharmacie,* February 1845.)—As arsenical injections are very often used now to preserve bodies for dissection, it is right to be aware of the dangers resulting from the practice. At a *concours* held lately at Montpelier, six bodies were given for dissection, five of which were injected with an arsenical solution of the strength of about 900 grains of arsenious acid to about 2¼ pounds of water. The five gentlemen to whom these injected subjects were allotted were attacked with severe symptoms of arsenious poisoning, as drowsiness, colic, diarrhœa, vomiting. All, too, were affected with a severe and continuous lancinating pain at the extremities of the fingers. This pain had its chief seat in the bulb of the finger and the circumference of the nail. The painful part was visibly swollen, and an appearance resembling ecchymosis was perceived through the nails, which were afterwards cast off. These five individuals were also troubled with uneasy tremors of the upper extremities. They all recovered. It is asked whether these symptoms, especially the pains in the fingers, were produced by the direct absorption of the poison, or by the breathing the arseniuretted hydrogen, which it has been ascertained animal bodies exhale when preserved by means of arsenic? Perhaps both causes had their share in the production of the symptoms.

*Case of Poisoning by an extremely small dose of Morphia.* By Dr DANYAU. (*Gazette des Hopitaux*, November 1844.)—A woman with disease of the uterus was suffering from obstinate vomiting. For this a blister was applied to the epigastric region, and dressed with the thirty-second part of a grain of the hydrochlorate of morphia. As this very small quantity produced scarcely any effect, it was repeated the next day. Shortly after this she fell into a state of complete narcotism. There was great drowsiness, ringing in the ears, fever, marked alteration in the intellect, objects were seen indistinctly, so that only the eye or arm of her attendants were seen, and soon she was seized with convulsions. She was twice bled, ice was applied to the head, sinapisms to the thighs, and she gradually recovered, though for several days there remained weakness, confusion of sight, and embarrassment of speech.

*Case of Poisoning by Truffles.* By M. BERGER. (*Annales d'Hygiene Publique*, January 1845.) Truffles (*morchella esculenta,*) have been frequently noticed to produce slight gastric derangements. The following case by M. Berger shows they may give rise to severe symptoms of poisoning. Two women, the one of a feeble constitution, the other more robust, dined on truffles. The master of the house ate of the same dish, but only in small quantity, and suffered no inconvenience therefrom. In the evening the women suffered from nausea, vertigo, and repeated attacks of painful vomiting and retching, with a general sensation of weakness. These symptoms increased in severity during the night. The vomiting, which became almost constant, brought up nothing but a glairy liquid without any traces of food. Towards morning the vomiting somewhat abated. During the course of the night a smart diarrhœa attacked the most feeble of the women, which speedily cleared out the contents of the intestinal canal, removing with them all the noxious matters. The consequence was that the symptoms of poisoning rapidly yielded and she speedily recovered. The strongest woman, however, was not so affected. Her bowels were constipated, and on account of the temporary amelioration as morning advanced, a physician was not sent for till twenty-four hours after the truffles were eaten. By this time all the poisonous symptoms were renewed with redoubled severity. M. Berger found her much pained, and a prey to incessant and useless efforts to vomit. She had quite the look of a person in cholera. The pulse was not frequent; the skin was soft to the touch; the face, which was pale, and with a leaden hue around the eyes, was covered with a cold sweat; the præcordial region was painful, and there was complained of a spasmodic constriction across the thorax, great anxiety, restlessness and weakness. Vertigo was also present above all when the efforts to vomit were made. As the stomach obstinately rejected all medicines, recourse was had to glysters of camomile infusion. Blood-letting was also employed, as well as other remedies, to prevent the threatened gastro-intestinal inflammation. It was the fourth day, however, before the symptoms began to abate, and the fifth before they yielded.

The truffles which had caused these poisonous symptoms had been kept for some days when the temperature was somewhat high. This had probably caused some change in their chemical composition, and given rise to the production of the poisonous symptoms.

*A Memorial addressed to the Right Hon. Sir James Graham, Bart. M. P., Her Majesty's Principal Secretary of State for the Home Department, by the Royal College of Physicians of London, June 18, 1845.*—The Royal College of Physicians of London feels itself called upon respectfully to address Sir James Graham on the important alterations which have been made by the Committee of the House of Commons in the bill for regulating the profession of physic and surgery.

Enactments, equally new and important, have now been introduced into it for the first time, which were never contemplated in the course of the discussions that have hitherto taken place between the college and Sir James Graham.

In order to explain its views respecting these enactments, the college begs, in the first place, briefly to recall to Sir James Graham's recollection the tenor of those discussions and the circumstances connected with them.

Before any measures affecting the medical profession had been submitted to Parliament by the Secretary of State, the college had carefully investigated the grievances complained of in numerous petitions to Parliament for medical reform, and had laid before the Government some suggestions concerning them.

The most prominent of the alleged grievances were found to be as follows :—

1. The want of a general registration of licensed practitioners.
2. The want of some body or board to which questions of medical polity and of public health might be referred.
3. The existence of local jurisdictions, and consequent restrictions upon practice and inequality of privileges.
4. The want of uniformity in the education and examinations conducted by different institutions, and great disparity thence arising in the qualifications of practitioners passing under the same denomination.
5. The continuance of self-election in the governing bodies of the different medical corporations.

The college has already taken occasion to express to Sir James Graham its approbation of the manner in which the two first-mentioned wants are supplied by the bill, viz. by the system of general registration therein directed, and the establishment of a Council of Health.

With respect to the two following grievances, the college suggested that, provided uniformity of qualifications could be obtained, reciprocity of privileges might properly be granted. And it professed itself ready to concede to a considerable extent its own peculiar privileges, and to confer, without further examination, the license to practice in London on the graduates and licentiates of Ireland and Scotland, *provided it could be assured that such licentiates and graduates had been educated up to the standard which the college had fixed as necessary for physicians.*

For the college has constantly retained, and often expressed its desire that nothing should be done to lower the standard of the general and professional acquirements of physicians: and it is but justice to Sir James Graham to state that he has always manifested a cordial participation in this desire of the college.

Nevertheless, the college fears that clauses which have been introduced into the bill are not unlikely to cause that standard to be lowered. For instance, the 23d clause allows any university to confer the degree of licentiate in the faculty of medicine upon students, of the age of twenty-two, after five years of professional study, only two of which will have been passed in a university, and without any security for a preliminary education or examination in literature and science. Now there will be no restriction to prevent these licentiates from graduating as doctors of medicine, so soon as they shall have reached the age of twenty-six, and that withou further university residence or professional study; for the 22d clause, the only one imposing any restriction on medical degrees, does not require for doctors of medicine a term of residence of longer duration, or a course of study of greater extent and comprehensiveness than those already specified.

This early age of graduation and limited course of study are clearly at variance with the intentions of the college and the spirit of the 16th clause of the bill, by which physicians ought to be devoted to their studies up to the age of twenty-six.

For the reasons which have been assigned, the college considers the 23d clause to be inexpedient. It would seem also to be introduced unnecessarily, because by the 14th clause provision is, as it should be, made to enable those who wish to act as general practitioners to do so at an early age. And such persons may afterwards, by one of the provisions of the 16th clause, become physicians, if by successful cultivation of medical science they have raised themselves in general estimation.

With respect to the last of the grievances above-mentioned—self-election into the governing bodies of the medical corporations—the college offered to redress this grievance, as far at least as physicians in this country are concerned, in the most complete manner, by opening the fellowship to all licentiates of four years standing, and by giving to all the right of voting in the election of fellows; as well as by other provisions of a liberal nature; especially, by offering to admit as associates, without examination and upon a reduced fee, all bona fide physicians now practising in England and Wales.

The college was then informed, by a letter which its president had the honour to receive from Sir James Graham in February 1842, that if the alterations above stated, and others of a similar nature suggested in that letter, were made in the internal constitution of the college, it was the intention of Her Majesty's Government to propose a measure to Parliament whereby the powers and privileges of the college, as an *examining* body, would be greatly increased. According to the advice thus tendered, and with the sanction and co-operation of the law officers of the crown, the college proceeded to prepare, with considerable pains and expense, the draft of a new charter, embracing the alterations which it had itself proposed, as well as those suggested by Sir James Graham. The college has ever since been waiting for an act of the legislature to enable it to accept this charter. It deeply regrets that, meanwhile, the general bill, in conjunction with which the new charter was to have been accepted, has, in many respects, been materially altered.

As the bill was originally framed, the college was required indeed to surrender the examination of all Scotch and Irish physicians; but it was authorised to superintend the examination of all persons, of whatever grade, who should seek to obtain in this country a license to practice medicine. And as the college was instituted for the promotion of medical science, it does indeed seem proper that to it should be entrusted the duty of testing the qualifications of all those who are to have the sanction intended to be given by the bill of being qualified to practise medicine, just as to the College of Surgeons was to be entrusted the duty of testing the qualification of persons to practise surgery. In the bill as previously framed, and even in its amended form, this idea is carried out in regard to general practitioners in Scotland and Ireland; for to the respective Colleges of Physicians and Surgeons, in each of those parts of the United Kingdom, is entrusted the function of examining general practitioners. And the college believes that such a principle, if carried out in England, would ultimately give satisfaction to the great body of general practitioners throughout England and Wales, as well as tend to the advantage of the public.

By the amended bill, however, the authority to examine general practitioners is no longer given to the College of Physicians of England, although it is still given to those of Scotland and Ireland. Nor, in the opinion of the college, is anything like an equivalent for it afforded by the 17th clause of the bill as amended, which clause prescribes only a *preliminary* examination before a joint medical and Surgical board.

It does not appear to the college to be at all a proper arrangement, that persons who have undergone a previous examination by physicians and surgeons, should be examined, subsequently, in medicine and surgery, by general practitioners.

It is a further and great objection to such double examination, that it must operate as a discouragement to medical education in England, since in Scotland and Ireland a single examination will be sufficient to qualify for practice.

With respect to the new incorporation, made known in the amended bill by the name of "the Royal College of General Practitioners *in Medicine*, Surgery, and Midwifery of England," the college, without objecting to the incorporation of the general practitioners, would press upon the attention of Sir James Graham, that as the College of Physicians was specially founded for the promotion of medical science and for the regulation of medical practice, there are strong objections to the assumption by this new institution of the title of the "Royal College of Practitioners in Medicine."

Nor is it to the assumption of a title only that the college sees reason to object. It must object, even more strongly, to the latter part of the 32d clause, which gives to general practitioners the right to fill ALL *medical and surgical offices*, and thus confides the highest duties of the profession to the members of that class which is required to pass through the least extended education, and which is admitted to practise at the earliest age.

In offering the foregoing observations, the college is so fully convinced of Sir James Graham's desire to maintain a high standard of education for physicians, as well as to support the college in the discharge of its proper functions, and even to extend, if possible, its sphere of utility, that it cannot doubt that the remarks which a sense of duty has dictated, will be received with the candour and the attention which the college has met with from Sir James Graham on every occasion.

There are other points in the bill, of minor importance, to which the college is also desirous of requesting Sir James Graham's attention.

With respect to the constitution of the Council of Health, if the representative principle is to be retained, at least in part, there ought not be two members of it returned by the College of General Practitioners, since one member only is to be returned by each of the Colleges of Physicians and Surgeons.

In clause 27, "for securing efficiency of examination," Sir James Graham has yielded to the wish of the college, that none but professional persons should be allowed to be present at the examinations. The alteration, however, which has been made in the composition of the council, seems to render it even more desirable than before, in order to obviate some possible jealousies and interferences between the different orders of the profession, that no one should have an absolute right to be present at the examinations, unless deputed by the council for that purpose.

As regards the arrangements for general registration, the college observes with satisfaction, that the register is now expressly ordered to be received as evidence in courts of law. It does not seem, however, sufficiently clear, whether the supplemental register, provided by the amended bill, is intended to contain the names of *all* persons now legally practising, as well those with general as those with only local privileges. Those also who are entered on the supplemental register, should be required to send in annually their names and places of abode, as ordered by a previous clause with respect to the register.

In some points the bill has been amended to the satisfaction of the college. In particular the college approves of physicians and surgeons being compelled to enrol themselves in the college of the country in which they practise, under the penalty of being struck off the register. Also of a penalty for false pretences of qualification being imposed by clause 38, not only on persons unregistered, but on those also who should use a name or title belonging to a class in the registry to which they do not belong.

In conclusion, the college ventures to express a hope that Sir James Graham may find it possible to modify the bill in accordance with the views which have now been respectfully offered. For thus, in the judgment of the college, it is likely to be productive of greater advantage to the profession and the public than can justly be expected from it under its present form. FRANCIS HAWKINS, *Registrar.*

*Medical Graduations at Edinburgh.*—On the 1st of August 1845, the Senatus Academicus of the University of Edinburgh conferred the Degree of Doctor of Medicine on the following gentlemen, in number seventy-nine, after having gone through the appointed examinations, and defended publicly their Inaugural Dissertations.

William Henry Addison, England, Observations on some few subjects connected with Midwifery.

William Aitken, Scotland, on the Influence of Vaccination on the Prevalence and Severity of Small-Pox.

James Allen, Nova Scotia, on the Principal Deformity of the Pelvis in relation to Parturition.

Alexander Tod Anderson, Ireland, on Inguinal Hernia.

James Anderson, Scotland, on Scrofula.

Charles David Arnott, England, on Aneurism.

Henry Arnot, Scotland, on the Physiology and Special Pathology of Asphyxia.

John Barclay, Ireland, on Syphilis.

James Heaton Bennett, England, on Fever.

Alexander Laing Bogle, Scotland, on Diseases of Synovial Membrane.

George Frederick Bone, Barbadoes, on Yellow Fever.

Edward Barons Bowman, East India, on Gangræna Senilis.

James Braid, Scotland, on Diseased Nutrition.

Patrick Brennan, Ireland.

George Brewster, Scotland, on Inguinal Hernia.

William Alexander Bryden, Scotland, on Intermittent Fever.

Robert Addison Byers, England, on the Saliva and Gastric Juice.

David Francis Sitwell Cahill, Berwick on Tweed, on Diabetes Mellitus.

Alexander Forrester Calder, Scotland, on Typhus.

George Fenton Cameron, Scotland, on Insanity.

Salomon Edward Caspersonn, Prussia, de Galvanismo in Paralysi adhibendo.

Matthew Combe, Scotland, on the Diagnosis and Treatment of Diseases of the Knee-joint.

Thomas Crawford, Ireland, on the History, Causes, Pathology, and Treatment of Paralysis.

Henry Crookenden, England, on the Structure and Diseases of Bone.

Richard Dill, Ireland, on Dyspepsia.

John Robert Dickson, Scotland, on Uterine Hæmorrhage in connection with Pregnancy.

Richard Domenichetti, England, on Functional Diseases of the Liver.

John Dunlop, Scotland, on the Influence the Mind exercises over Disease.

James Ellison, Scotland, on Bronchotomy.

Gerald Fitzgerald, Ireland, on the Nervous System.

Thomas Fraser, Scotland, on Inflammation of Bone, and certain Pathological conditions which arise from various stages of the Process.

William Tennant Gairdner, Scotland, on Death.

John Hutchinson Garner, Ireland, Observations on Birds.

James Donaldson Gillespie, Scotland, on the Reproduction of Bone after Necrosis.

Ray Charles Golding, England, on Chronic Diseases.

John Grant, Scotland, on Hæmorrhage, Accidental and Unavoidable.

James Stephen Hackett, Canada, on Asphyxia.

George Haworth, England, on Tobacco.

James Adam Hunter, Scotland, on Aneurism.

Laurence Ramsay Hynd, Scotland, on the Influence of Vaccination on the Prevalence of Small-Pox.

John Hutchings Jerrard, England, on Surgical Hæmorrhage.

George Johnston, Ireland, on Hypertrophy of the Heart.

James Keith, Scotland, on Inflammation of the Cellular Tissue of the Pelvis.

George Hugh Kidd, Ireland, on Vaccination, its Protective Power, and the Proofs of the necessity of Revaccination.

Alfred Sinclair Kingdon, England, on Delirium Tremens.

Andrew Legat, Scotland, on Hydrocele of the Tunica Vaginalis.

James Logan, England, on the Particular Symptoms occurring in Phthisis Pulmonalis.

John Mackay, Scotland, on the Principal Forms of Serous Effusion, and their Causes.

David Mackintosh, Scotland, Sibbens identical with the Exanthematic Group of Venereal Diseases.

James Innes Mackintosh, Scotland, on the Effects and Indications of Blood-letting in Inflammation in general

Daniel Maclachlan, Scotland, on the Croup.

William Main, Scotland, on Tobacco.

Chas. Martin, England, on Digestion.

Robert Thomas Martland, England, on Nutrition.

James Henry May, England, on Delirium Tremens.

George Augustus Mein, Scotland, on Scarlatina.

Frederick George William Mullar, Berlin, on the signs of Pregnancy.

Brinsley Nicholson, Scotland, on the Coagulation of the Blood.

William Allen Nicholson, Barbadoes, on the Particular Forms of Death, more particularly the Anatomical signs of Syncope.

Samuel Nicholson, England, on Delirium Tremens.

John Robert Oliver, Isle of Man, on Chlorosis.

John Greenway Overton, England, on the Diseases of the Larynx and Trachea.

John Watson Pacey, England, on Gunshot Wounds.

Daniel M'Neill Parker, Nova Scotia, on the Mechanism and Management of Parturition.

Hector Peltier, Canada, des Retrecissimens de l'Urethre.

John Pirie, Scotland, on Tubercle.

George Hutchinson Ray, England, on Intermittent Fever.

John Roberts, Wales, on the Influence of Temperature on the Health of Man.

James Hunter Robertson, Scotland, on the Induction of Premature Labour.

William Judson Van Someren, East Indies, on the Causes of Difference in the Facility of Parturition in the different Races of Man

George Charles Stacpoole, Wales, on the Correct Method of Examining Patients and observing Disease.

Henry James Stokes, England, on Dropsy.

John Struthers, Scotland, on the Physiology and Physiological Anatomy of the Muscles and Nerves of the Eyeballs, and on the Theory of their Derangement in Strabismus.

George Thompson, Scotland, on the General Doctrines of Dropsy.

Samuel Reeve Tucker, Bermuda, on the Cure of Aneurism.

Robert Wallace, Ireland, on the Symptoms, Pathology, and Treatment of Rheumatism.

Thomas West, England, on Intermittent Fever.

Robert Wilson, Scotland, on Pulmonary Tubercle.

Thomas Wright, England, on Voltaic Electricity and Electro-Magnetism, and their Application to the Cure of Disease.

*Surgeons' Hall, Edinburgh, 11th November* 1844.—Since Lammas last, the following Gentlemen have offered themselves as Candidates for the Diploma of the Royal College of Surgeons of Edinburgh, and after producing satisfactory evidence that they had completed the course of study prescribed by the College, have been admitted to examination, and found fully qualified to practise the arts of Anatomy, Surgery, and Pharmacy, and have received Diplomas as Licentiates of the College accordingly:—

*Scotland.*

Robert Nicholson
David Purdie Maclean
John Mackay
William Tibbets
Aw. Howden Balfour
James Adam Hunter
David Dunlop Service
Alexander Leitch
John Murray
John M'Gregor
John Grant Nicolson
Ronald Bayne
Michael Baird
William Rogers
J. W. Johnston Anderson
James Veitch
James Craigie
Thomas Masson Lee
William Duncan
James Anderson
Andrew Scott Myrtle
George Augustus Mein
James Lee
Jn. Innes Mackintosh
David Findlay
William Cameron
Alexander Laing Bogle
C. Lockhart Robertson
John Poor Murray
Wm. Blair Hamilton
James Milne
Robert Fraser Robb
Henry Arnot
David Brodie
John Gunn
George Thomson
David Henry Small
James Drummond
William Malloch
Thomas Fraser
Jas. Innes Mackintosh
Laurence R. Hynd
James Lilburne
James Anderson
D. Maclachlan Maclure
Matthew Combe
John Gillespie
David Findlay
Hugh Bryce
John Henderson
John Fisher
John Mitchell
Alexander Martin
James Webster
Robert Murray
James Reid
Geo. William Balfour
Jas. Bruce Thomson
Archibald Blair
William Robertson
Alexander Simson
William Bruce
Matthew Jas. Turnbull
John Howden
James Kellie
John Struthers
James Stewart Fowler
James Hurdis Black
David Mackintosh
James Craigie Murray
Peter Gibson
James Braid
John Grant
Geo. Fenton Cameron
George Gordon
Charles Robertson
John Dunlop
Thomas Girdwood
Robert Wilson

*England.*

Samuel Prynn
Frederick Douglas
Thomas Chater
Edmund Hutchinson
Henry Hill
William Peach
Rich. Heathcote Wake
Geo. Hutchinson Ray
Sam. Taylor Chadwick
Samuel Turrell
Richard Domenichetti

*Ireland.*

Patrick Brennan
John M'Donogh Stokes
Patrick Arthur
Joseph Largan
Patrick Arthur
Richard Malcomson
John Hurst
John Byrne
Robert Clarke
Terence Brodie
Robert Wallace
Percy Swan Waddy
Robert Hy. Emesson
Alex. Todd Anderson
Richard Wilme
Samuel Boyd
Richard Dill
Thomas Crawford
John Barclay

*Abroad.*

Henry Huggins Jones
Samuel M. C. Steele
Fridrick G. W. Mullar
John Syme
Samuel Reeve Tucker
John Edward Rankin
Alex. Russell Atkinson
Daniel M'Neill Parker
Salomon Ed. Caspersonn

Extracted from the Records of the Royal College, by

John Scott, *Secy.*

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END OF VOLUME SIXTY-FOURTH.

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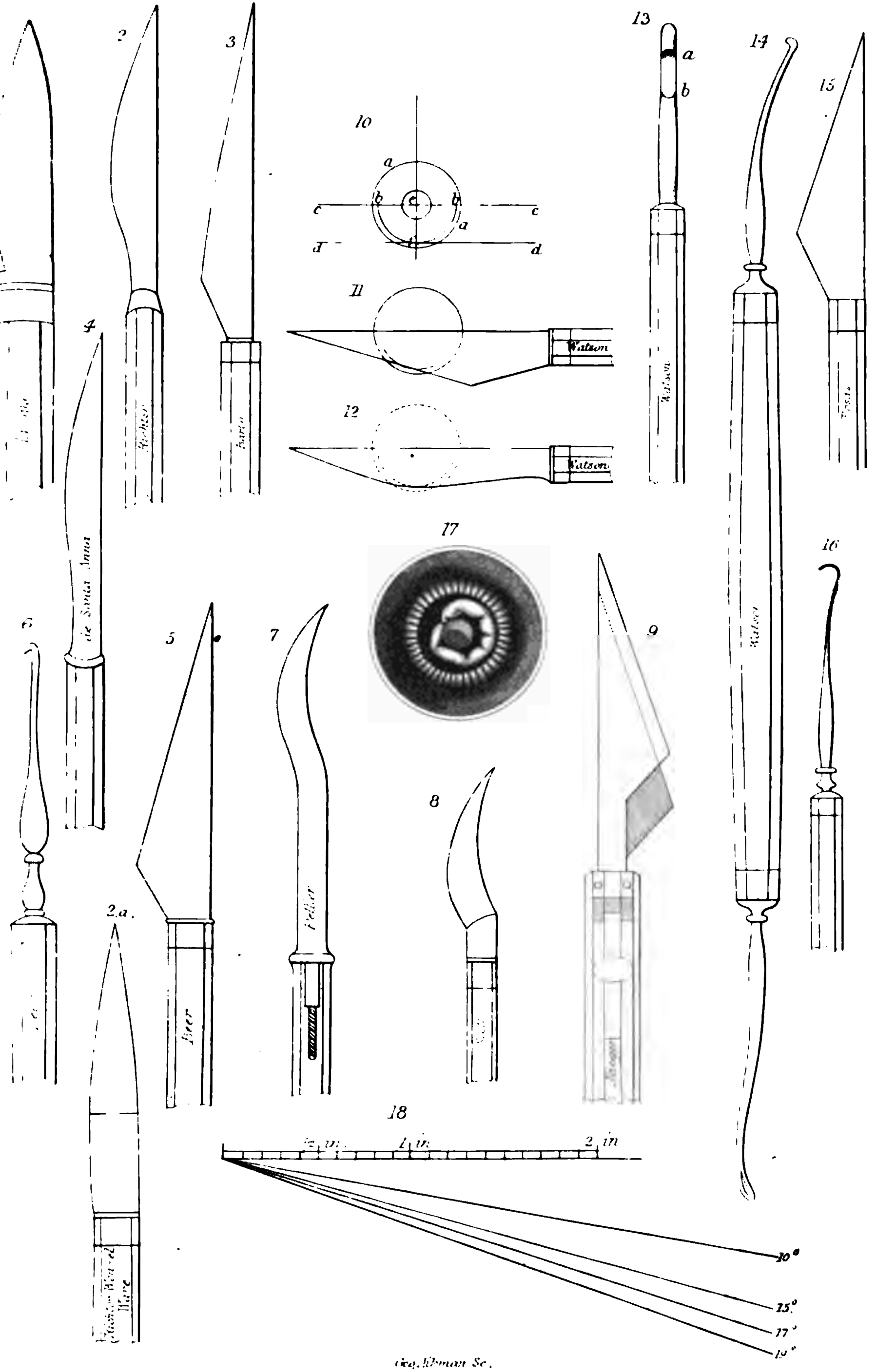
# PLATE II,



Geo. Aikman Sc.

JUN 1969

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